

[The Catt Question](#)

19manbk1

Scandals in Electromagnetic Theory <http://www.ivorcatt.com/28scan.htm>

Non-technical philosophy from the book <http://www.ivorcatt.com/28anomp.htm>
[Animations](#)

The Catt Anomaly

Science beyond the Crossroads

Ivor Catt

Westfields Press,
 121 Westfields, St. Albans AL3 4JR,
 England 1996, 2001

First published in 1996 <http://www.electromagnetism.demon.co.uk/wbabanbk1.htm>
 Republished with additions in 2001

Computer files nos. 19manbk1, 19nanbk1,
 166anbk2, 16danbk3, wa8anbk4
 16ganbk5, 074anbk6, 16kanbk7, 178anbk8
 18sanbk9, w98jakv, w9aspine, w9ajaku

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[Original ISBN was 0 906340 13 6]

British Library Cataloguing in Publication Data

Catt, Ivor
 The Catt Anomaly : science beyond the crossroads - 2nd ed.
 1. Electromagnetic theory
 I. Title
 530.1'41

ISBN: 0 906340 15 2

19nanbk1

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Preface to 2001 Edition

On 6th May 2000, Sir Andrew Huxley, Master of Trinity 1984 - 90; President of the Royal Society 1980 - 85; (joint) Nobel Prizewinner for Physiology or Medicine 1963, was Master of Ceremonies at Trinity College High Table. Ivor Catt, as a member of Trinity, is allowed to bring a guest to High Table once per year. Although Sir Andrew invited me to sit next to him during dinner, I placed my Physiology guest from Dublin next to him instead.

Later, upstairs, where I sat next to him, while the Combination Wines; Ch Guiraud 1988, Ch Lynch Bages 1982, and Warre 1970, went round with the Stilton, I began by regaling Sir Andrew with the contents of my article "The Clever take the Brilliant" (on my website), which he found very interesting. I said that my special interest was censorship in science, and that I had lectured on it to the Ethical Society in London. Sir Andrew said it had not occurred to him that professionals might block scientific advance because it threatened their careers. However, he then volunteered that, to his great regret, a great deal of very good work in his field early in the twentieth century had been suppressed, and had disappeared from the record. He also cited the neglect of Mendel, also in his field.

I then took him through the case of the Catt Anomaly. He told me that he knew Pepper. After half an hour to an hour, when I said that I did not need to tell him more, because my book The Catt Anomaly was in the library of Trinity College, he said he would get the book out. That night, back at home in St. Albans, I put what he had said onto my website, and sent him a copy. He replied by letter, see p67.

[sep01 Catt was invited to speak to the Cambridge University Engineering Society on The Catt Anomaly on 15nov01. See p71 and www.electromagnetism.demon.co.uk/07091.htm]

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Introduction

"Although the principle of free communication of ideas is a basic tenet of the scientific community, there are numerous examples of their suppression. Professor Herbert Dingle, who wrote a book on relativity in the 1920s as well as the section on relativity for Encyclopaedia Britannica, and was the man chosen by the BBC to give the eulogy on

Einstein when he died, developed doubts about the special theory of relativity around 1955. To his astonishment, he found that the scientific journals and institutions suddenly closed their pages and doors when he wanted to say something unorthodox; that is, heretical. A scientist might say, 'something that was incorrect'. He describes his experience in his book, *Science at the Crossroads*, pub. Martin Brian O'Keefe, London, 1972."

The above paragraph is the start of my 1978 article "The Rise and Fall of Bodies of Knowledge", reprinted here in appendix 1.

The present book takes us forward 25 years from the experience of Dingle, a Quaker like me, with whom I once talked briefly on the telephone. Dingle's centrepiece was the Twin Paradox, which I argue is a kosher argument; the one argument that is allowed at the fringe of relativity theory. Louis Essen, elected FRS for developing the Caesium clock, told me that Dingle queered the pitch by making a mistake. Essen also told me that he himself had been suppressed. His most exciting story was that the Institute of Physics broke its contract with Essen to publish an article of his even after he had checked the galleys. The Inst. Phys. also broke its contract with me to publish the article which later appeared in *Wireless World* in March 1979.

The case of the Catt Anomaly goes to the heart of elementary electrical theory. It is much simpler and much more important than Dingle's Twin Paradox.

The best introduction to the politics of knowledge in science, and the best scientific demonstration that the scientific Age of Reason is over, is to study the present status of the Catt Anomaly. The reader can stop here and test the following proposition for himself. No scientist is willing to take a scientific approach to the problem of suppression in science - the allegation of widespread censorship, to be tested by the usual criteria of repeatability, corroboration, Popper's falsification and the rest. Try to get a scientist to remain a scientist when addressing these matters! He will start talking about Catt's paranoia or egotism, which are not scientific concepts.

Perhaps more properly called 'The E-M Question', the Catt Anomaly is an elementary question about classical electromagnetism which experts refuse to answer in writing. We will first consider the contradiction between Pepper and McEwan, and the response of London's Institution of Electrical Engineers (IEE) to the problem created by this contradiction.

It is important for the reader to keep struggling with the problem until absolutely convinced that it is beyond his comprehension. Unlike the Twin Paradox, the Catt Anomaly is an elementary problem in

electricity which most people with a B grade pass in GCSE Physics should be able to understand well enough for the purpose of reading this book.

When a battery is connected to a resistor via two parallel wires, a current flows which depends on the voltage of the battery and the resistance of the resistor. Also, electric charge appears on the surface of the wires, and we concentrate on the electric charge on the bottom wire. In the case of a 12 volt car battery and four ohm car headlight bulb, the electric current is three amps and the resulting power in the lamp is 36 watts.

Consider the case when the battery and lamp are connected by two very long parallel wires, their length being 300,000 kilometres. When the switch is closed, current will flow immediately into the front end of the wires, but the lamp will not light for the first second. A wave front travels forward between the wires at the speed of light, reaching the lamp after one second. This wave front comprises electric current, magnetic field, electric charge and electric field. Negative charge appears on the surface of the bottom wire. All of this is agreed by all experts.

The question asked by the Catt Anomaly is where this charge on the bottom conductor comes from, and the answers given to this elementary question are contradictory, with the academic establishment split down the middle. Half of the academics, led by McEwan, say that the charge comes from the battery to the west and reaches its proper place along the bottom conductor without having to travel at the speed of light. The other half of the academics, led by Pepper, say that it is impossible for the charge to come from the west because it would have to travel at the speed of light, resulting in the charge having infinite mass. Pepper says that at the moment when charge is needed to help the wave front along, it comes to the surface of the wire from inside the wire, travelling at right angles to the direction of the wave front.

More technical discussion of battery and lamp, taken from my book "Electromagnetics 1", is in Appendix 2.

The standard version of the Catt Anomaly, as presented to Pepper and McEwan and the IEE, is on page 3.

January 2000. In 1998 the IEE published a paper discussing the Catt Anomaly. See page 59 and <http://www.electromagnetism.demon.co.uk/y7aiee.htm>
For more information, see www.electromagnetism.demon.co.uk and www.ivorcatt.com

Ivor Catt is at ivorcatt@electromagnetism.demon.co.uk

Animation of the Catt Anomaly <http://www.electromagnetism.demon.co.uk/catanoi.htm>

CATT'S ANOMALY

The Question

Traditionally, when a TEM step (i.e. logic transition from low to high) travels through a vacuum from left to right, guided by two conductors (the signal line and the 0v line), there are four factors which make up the wave;

- electric current in the conductors
- magnetic field, or flux, surrounding the conductors
- electric charge on the surface of the conductors
- electric field, or flux, in the vacuum terminating on the charge.

The key to grasping the anomaly is to concentrate on the electric charge on the bottom conductor. During the next 1 nanosecond, the step advances one foot to the right. During this time, extra negative charge appears on the surface of the bottom conductor in the next one foot length, to terminate the lines (tubes) of electric flux which now exist between the top (signal) conductor and the bottom conductor.

Where does this new charge come from? Not from the upper conductor, because by definition, displacement current is not the flow of real charge. Not from somewhere to the left, because such charge would have to travel at the speed of light in a vacuum. (This last sentence is what those "disciplined in the art" cannot grasp, although paradoxically it is obvious to the untutored mind.) A central feature of conventional theory is that the drift velocity of electric current is slower than the speed of light. [Published in Electronics & Wireless World sep84, reprinted sep87. For further information on the Catt Anomaly, see letters in the following issues of Wireless World; aug82, dec82, aug83, oct83, dec83, nov84, dec84, jan85, feb85, may85, june85, jul85, aug85.]

@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@

Trinity College, Cambridge, wrote to past members of the college including myself asking for money to finance their expansion programme. They argued that Trinity had been in the forefront of academic advance, and my money would help to keep them there. I replied that Trinity and Cambridge had for twenty-five years refused to comment in any way on Catt's theories on electromagnetism, and for ten years on the Catt Anomaly, a problem in classical electromagnetism, of which I enclosed a copy (above). I suggested to Atiyah, Master of Trinity, a mathematician, that he cause his leading expert to comment. The result was the following letter from Pepper. I also include a part of his later letter to my colleague Raeto West, which clarifies his position;

UNIVERSITY OF CAMBRIDGE

DEPARTMENT OF PHYSICS

CAVENDISH LABORATORY

MADINGLEY ROAD

CAMBRIDGE CB3 0HE

From: Professor M. Pepper, FRS

June 21, 1993

Ivor Catt, Esq.,
121 Westfields,
St Albans
AL3 4JR

Dear Mr Catt,

As a Trinity physicist the Master suggested that I might provide some comments on the questions raised in your recent letter to him on aspects of electromagnetic theory.

If I understand the position correctly, your question concerns the source of the charge at a metal surface which by responding to the presence of the EM wave ensures that the reflectivity of the metal surface is virtually unity, hence providing waveguide action and related applications.

If I may restate the basis of your question, what is the maximum frequency of radiation which is reflected? It is this parameter rather than light velocity which is important. The solution lies in the maximum frequency response of the electron gas, which is the plasmon frequency ω_p and is calculated in a straightforward way. If light frequency is greater than ω_p then the electron gas in the metal can no longer respond and the reflectivity tends to zero. The problem you are posing is that if the wave is guided by the metal then this

implies that the charge resides on the metal surface. As the wave travels at light velocity, then charge supplied from outside the system would have to travel at light velocity as well, which is clearly impossible.

The answer is found by considering the nature of conduction in metals. Here we have a lattice of positively charged atoms surrounded by a sea of free electrons which can move in response to an electric field. This response can be very rapid and results in a polarisation of charge at the surface and through the metal. At frequencies greater than ω_p the electron gas cannot respond which is the reason for the transparency of metals to ultra-violet radiation. However for frequencies used in communications the electron gas can easily respond to the radiation and reflectivity is unity.

If a poor conductor is used instead of a metal, i.e. there are no freely conducting electrons, then there is no polarisation, and as you point out charge cannot enter the system, and there can be no surface field. Consequently reflection of the radiation will not occur at these low frequencies and there is no waveguide action.

I hope that these comments provide a satisfactory explanation.

Yours sincerely,

[signed] M Pepper

cc: Sir Michael Atiyah - Trinity College [Master]

Mr. A Weir - Trinity College

Telephone: 0223 337330

August 23, 1993 Dear Raeto West, I write with reference to your letter of August 19. Your description of the process is correct; as a TEM wave advances so charge within the conductor is polarised and the disturbance propagates at right angles to the direction of propagation of the wave Yours sincerely, M Pepper

The portions of Pepper's letter which strike you as either too erudite for your comprehension or else as drivel, are drivel. Generally, he has copied out irrelevant slabs of material from text books.

Portrait of a Drivelmaster; <http://www.admin.cam.ac.uk/univ/annualreport/1996-7/c.html>

This was an exciting development. For the previous decade, all experts, when trapped into commenting, had insisted that the charge came from the west, and did not have to travel at the speed of light. Now we had an accredited expert, writing under instruction from his

boss, saying that the charge could not come from the west, but came from the south.

There the matter rested for two years, until a group of mature, dissident Combined Humanities undergraduates at Bradford University organised a week-end conference entitled "What is Education For?" I offered to give a paper entitled "The Politics of Knowledge in Science". This was accepted, Kathy Symonds telling me that I served a useful function, because apart from me they had failed to link up with science, and also because the lecturers who asked to speak all turned out to be Establishment, which I was not quite.

This was the second time that I became kosher for a short period in a university, admittedly only Bradford, and so had more power to elicit rational comment on science. As part of my presentation, I asked Kathy Symonds in advance to ask the appropriate official to instruct the top expert to comment on the Catt Anomaly. Here is her letter, and McEwan's reply.

Dear Professor John Gardner [Dean of Engineering]

As part of our program,. "What is Education For?", we need comment from the accredited Bradford University expert on the subject below. I shall be very grateful if you send me written comment before the start of our seminar on 22apr95.

Thank you very much for your time and trouble

[signed] Kathy Symonds.

P.S. I enclose an S.A.E. for your reply.

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To Kathy Symonds 20 April 1995 Phone 01274-384006

Dear Kathy,

John Gardiner has passed this on to me - I think I can claim to be reasonably competent to discuss it.

To deal first with the problem raised in "Catt's Anomaly", there is definitely a correct answer, and it is just that the new charge required in the one foot of cable DOES flow from somewhere to the left! The charges DON'T have to travel at anywhere near the speed of light to do this!

The sentence that begins "Not from somewhere to the left" is fallacious ... such charge would NOT have to travel at the speed of

light in a vacuum! The reason that the sentence cannot be grasped by those "disciplined in the art" is because it happens not to be true!!! It may be obvious to the untutored mind because they haven't had the theoretical training to see why it is wrong. It is exactly at the point where the assertion seems really obvious that you need to think most clearly to see where the logical deduction is unsound - and perhaps this is where the lesson for educators lies. The heart of the fallacy is as follows:

(a) If the voltage step originally at a transverse plane "A" on the conductors moves one foot to the right to a plane "B" (indeed about one nanosecond later) then it is true that a certain amount of charge must have entered the portion of the conductors between A and B. What is not true, however, is that any of the electrons that were in the neighbourhood of A actually had to travel to B to keep up the wave!

(b) The charge that appears between A and B is required to be uniformly distributed along the length between A and B. This charge really does enter at plane A - so how is it possible that the electrons didn't have to rush to the right at the speed of light? - I will now explain:-

(c) When the wires are electrically neutral, they are actually composed of vast numbers of positive charges and negatively charged electrons in equal densities - the total charge balances out. The thing we call the "charge on the line", which is required to account for the voltage wave is actually the unbalance between the two sets of charges.

(d) Imagine that, between A and B, you have 100 electrons and 100 positively charged nuclei arranged uniformly in pairs along one foot distance. There is no net charge.

(e) Now imagine that you push in one extra electron in at the left hand side A, and you squash the electrons up a bit so that they remain evenly spaced but now 101 electrons fill the distance that was previously occupied by 100. There is now a total of one unit of "charge on the line" between A and B, and, rather surprisingly, this unbalanced charge actually appears to be fairly uniformly distributed between A and B. The electron originally at A would only move about 1/100 of a foot as you squeezed the electrons closer together, and it would have to move this distance in the one nanosecond it took for the voltage wave

to move from A to B. The electrons further to the right would move even less.

(f) If you imagine that you did this again with a larger number of positive and negative charge pairs - say 1000 becoming 1001, then as you squeezed in the extra electron the one next to it would only have to move up about $1/1000$ of a foot in the one nanosecond - and so on.

If you go on increasing the density of available charges, you can easily see that the velocities required of the electrons to produce one unit of unbalance becomes smaller and smaller. (Also, the one unit of unbalance appears to be more and more uniformly distributed across the one foot of distance.)

It turns out that when you "put the numbers in" that the real number of free electrons in the one foot wire is colossal, and that consequently they only need to move at walking pace or less!

You can summarise all this by saying that the "charge" that is required to account for the voltage across the line is not produced simply by a small number of charges moving in to the section of line but by a very slight redistribution of a vastly larger number of charges that were already in that section! Putting it in still another way again, there has been a confusion over the identity of the charges that account for the voltage across the line.

You can go on describing this problem at deeper and deeper levels and it will go on revealing more and more interesting physics - which soon gets very hard. For example, there is a quite noticeable effect because you do need some force to keep the electrons moving against the collisions with the stationary atoms. This appears as resistance in the line and it can cause the advancing voltage step to become distorted, ie it smears out into a more gradual step.

At a higher level of precision there is even a very small effect from the finite acceleration of the electrons. As the voltage step passes over them, the local electrons in the conductor are accelerated (very rapidly!!!) to the very small speed that is needed. There is no paradox about the rapid acceleration of the particles, they are very light. This produces an extremely small effect on the velocity of the wave travelling down the line, but you would not be able to detect it at the frequencies used in ordinary electronics.

I hope this has helped and given you something to think about. The "anomaly" is very instructive educationally, it is a real challenge for the teacher to explain clearly, and a very good example of how fruitful it can be to be wrong about something!

Turning more generally to your 2 - day event, I am extremely intrigued about how "Catt's anomaly" came into the discussion. I do realise that progress has often been made by challenging orthodoxies, but in the case of Catt's problem I happen to think that the accepted theory gives a pretty good account, but you can learn a lot if you are really made to set out how. I would be very interested to hear what you make of my comments, and how they have been used in your event.

Best wishes

[signed] Neil McEwan (Dr.), Reader in Electromagnetics
[University of Bradford]

[Copy typed by I Catt, 1oct95]

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1caanbk3

McEwan was the orthodox response that I had been waiting for. I had not previously had it styled 'ex cathedra'; that is, stated by the accredited expert from an institution (Bradford University), under instruction from the appropriate top official of the institution (Dean of Engineering). I was now in a position to approach the accredited learned institution and ask them to help. This was a better chance to get rational comment on scientific fundamentals than I had had during the previous quarter of a century of searching. I had to tackle it in the best possible way, using comprehension and techniques that had developed since Dingle's day, as the whole of twentieth century science slid deeper into the morass of its own careful devising. Here was the best chance to scientifically establish the facts about today's science; possibly the last chance.

I took the Pepper/McEwan contradiction to the head of the IEE.

Ivor Catt, 121 Westfields,
St. Albans AL3 4JR,
England
(01727 864257)

26may95;

Second copy sent 27june95

Third copy sent 18aug95
Fourth copy sent 3sep95

The Secretary,
Institution of Electrical Engineers,
Savoy Place, London.
WC2R 0BL (0171 240 1871)

Dear Dr. J. C. Williams,

The Catt Anomaly.

An essential component of classical electromagnetism remains unstated. There is disagreement about this feature by accredited experts, Professor Howie FRS, Professor Pepper FRS, McEwan Reader in Electromagnetics, but no discussion by them to resolve the matter.

Is the IEE the accredited institution with a primary responsibility for Electromagnetic Theory? How does the IEE proceed in a situation like this, where the theory which is the basis for its raison d'être turns out to be unstated and unclear?

Yours sincerely,
Ivor Catt

encl.

21june93 statement on the Catt Anomaly by Pepper
20apr95 statement on the Catt Anomaly by McEwan
apr95 Half page note from Symonds to McEwan plus
description of the Catt Anomaly

Catt letter to Electronics and Wireless World, May95 [end
of encl.]

Summary of disagreement, or confusion, in classical
electromagnetism, below.

Summary of disagreement.

"Dear Professor John Gardiner, As part of our [Bradford university] program, 'What is Education For?', we need comment from the accredited Bradford University expert on the subject below" - Kathy Symonds, 4apr95.

"[Professor] John Gardiner has passed this on to me - I think I can claim to be reasonably competent to discuss it.... .. the new charge required in the one foot of cable DOES flow from

somewhere to the left! The charges DON'T have to travel anywhere near the speed of light to do this! It may be obvious to the untutored mind [plus Pepper FRS] because they haven't had the [Bradford univ.] theoretical training 1.... The [Catt] 'anomaly' is very instructive educationally...." - **Neil McEwan** (Dr), Reader in Electromagnetics [Bradford University], 20apr95.

".... As the wave travels at light velocity, then charge supplied from outside the system [i.e. from the left, or west,] would have to travel at light velocity as well, which is clearly impossible.we have a lattice of positively charged atoms surrounded by a sea of free electrons which move in response to an electric field...." - Pepper, 21june93.

".... as a TEM wave advances so charge within the conductor propagates at right angles to the direction of the wave." Professor **M. Pepper**, FRS., Cavendish Laboratory, Cambridge, 23aug93.

"Institution of Electrical Engineers - to promote the general advancement of electrical science and engineering and their applications, and to facilitate the exchange of information and ideas on those subjects; 130,000 members." President Sir David Davies - from p1557 of "The World of Learning 1995", Europa Pubs. Ltd. (italics by I.C.)

As you will see from the dating of my letter, the reply, from Williams' deputy, was long in coming. I learned later that Williams and Secker were new men, anxious to show more willing than their predecessors. This led them into the quagmire. The new broom got stuck in old, sticky cobwebs.

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Dear Mr Catt

Thank you for your letter of 18 August, to which the Secretary, Dr Williams, has asked me to respond.

Firstly, I should mention that we have had your book reviewed and that the resulting report will be published in the Electronics and Communication Engineering Journal - either in the October or December issue. [Actually oct95.]

The Institution has a responsibility to 'promote the general advancement of electrical science and engineering and their

applications and to facilitate the exchange of information and ideas on these subjects to the members of the Institution'. The general view of the experts within the IEE is that the so-called 'Catt anomaly' is not an anomaly at all, and does not, therefore, require discussion or exposition. The favoured explanation aligns with the statement to which you refer, attributed to Professor Pepper, namely that as a TEM wave advances, so charge separation occurs close to the conductor surface effectively giving a transitory current flow at right angles to the direction of wave propagation.

Yours sincerely [signed] Professor Philip E Secker
Deputy Secretary IEE 4sep95

Secker was politically inept to admit that the IEE had a responsibility in this matter, and in so doing he betrayed the forces of darkness. However, he showed better obfuscatory tactics by introducing the irrelevant question of the review of my latest book, which had been hanging over the IEE for more than a year. (Up to that date, there had been no evidence in IEE literature that Catt had ever contributed to electromagnetic theory. Except for the belated admission, fifteen years too late, of his contribution in another field, Wafer Scale Integration, Catt remained a non-person. The reader can learn about all these matters in Catt's may95 letter to Electronics World + Wireless World, reprinted here as appendix 3. Its present editor Eccles has since turned chicken and will not publish anything more by Catt.)

The important point is that Secker wrote that his IEE experts had backed the wrong horse, opting for Cambridge with its aberrant Pepper; (defying Gauss's Law by) producing charge from the south from inside the conductor like a rabbit from a hat. The IEE opted for prestige rather than for the more tenable explanation from lowly Bradford; that the charge came from the west, and somehow managed to do so even though it travelled too slowly. The IEE did not know that Pepper's boss Howie FRS was a Westerner, or they would have gone for his revered Cavendish seniority, and avoided the quagmire. The Westerner view could have been brazened out, and had been for the previous decade since the discovery of the Catt Anomaly in aug81, for instance in many letters to Wireless World. Pepper's ingenious but mad Southerner view could not.

I now no longer had to take sides, but only to get Westerners and Southerners to resolve their differences, a task which was to prove Herculean, as I expected. That is, I knew that the forces of darkness in today's science were entrenched, strong and determined.

Much activity followed during the next few weeks, but first we should jump to two further comments by Secker, to give a brief taste of what followed. Whereas above, on 4sep95, Secker wrote "...The favoured explanation aligns with the statement to which you refer, attributed to Professor Pepper,", seven weeks later, on 25oct95, he wrote; "Dr. McEwan really has the answer;". Thus, he was backing both the views whose contradiction was the cause of Catt writing to Secker's boss in the first place, and his boss instructing Secker to reply! Further, although on 4sep95 Top Dog in the IEE chose him as the appropriate expert to reply, after seven weeks of repeated pontification and obfuscation, Secker wrote on 26oct95; "I should explain that I am no expert in the area to which the 'Catt Anomaly' refers....". He repeated this claim on 19dec95. This earned the riposte on 15nov95 from Luca Turin, lecturer in biophysics in London University; "To claim, as Professor Secker does, that this is a problem requiring unusual erudition and expertise is disingenuous. It belongs in chapter One of all the textbooks." It also raises the question as to why Top Dog Dr Williams delegated to Deputy Dog Professor Secker the task of replying to Catt's letter. Was Professor Secker Emeritus Professor of the London School of Ducking and Weaving, not of Electromagnetism? Had Top Dog from the start seen the Catt Anomaly as a political, not a technical, problem, to be handled by his most senior political, rather than technical, Deputy Dog? Who then was Top Dog's most senior expert on electromagnetism? We get a clue from Secker writing on 19dec95; "I asked a number of 'experts' familiar with Ivor Catt's views if they would [review his book], but all declined." This leads us to a statement on 8nov95 by Wilson of the IEE; "The Institution does not have Technical Committees which address scientific principles." In turn, we compare this with Secker's original 4sep95 letter, above, which quoted; "The Institution has a responsibility to 'promote the general advancement of electrical science and engineering and their applications and to facilitate the exchange of information and ideas on these subjects....", which Catt had copied to Top Dog in his original 18aug95 letter. Also we note Secker 25oct95; "The reason that the Catt Anomaly has been around so long is that the 'experts' have not thought it of sufficient standing to take the trouble to demolish it!"

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The repeat experiment

Membership of the London I.E.E. totals 130,000. That of the New York Institute of Electrical and Electronic Engineers (IEEE) totals 300,000. All other electrical and electronic engineering institutions in the world have tiny memberships of around 6,000. Thus, a repeat of the experiment - finding that the institute 'top expert' disqualifies himself after a period - could only be usefully made with the other large institute, the New York IEEE.

I wrote to the Chief Executive of the IEEE;

John D Powers, 12sep95
Executive Director, Institute of Electrical and Electronics Engineers,
345 East 47th St., New York, NY10017, USA
Dear Dr. John Powers,
The Catt Anomaly.

A hiatus has recently become apparent in classical electromagnetism, described in the attached sheet. This is a matter of growing concern.

I enclose the 'Southerner' viewpoint presented under instruction by M Pepper FRS in his 21june93 and 23aug93 letters. On the reverse side you will find a description of the Catt Anomaly, followed by the 'Westerner' view, presented under instruction by Neil McEwan, Reader in Electromagnetics at Bradford University.

Please would you instruct your leading expert(s) on electromagnetism to comment on the matter, with a view to resolving a worrying uncertainty? As you know, the IEEE is the leading learned institution in the world in this field, and so will carry very great weight. Its high status is backed up by its massive 320,000 membership.

Yours sincerely,

Ivor Catt

Powers caused his top expert, Mink, to write the following letter to me. I have retained Mink's errors and exotic punctuation. However, the key point is that his letter is drivel, much on the lines of Pepper's drivel. Since Pepper came from the semiconductor theory stable, not Mink's microwave stable, their drivel does differ somewhat. (Compare Anglican with Catholic liturgy.)

Dear Mr. Ivor Catt,
As chairman of the IEEE Microwave Theory and Techniques Society committee on Microwave Field Theory, MTT-15, I have been asked to respond to your request to Dr. John Powers,

Executive Director, Institute of Electrical and Electronic Engineers.

I reviewed the previous responses you received from Professor M. Pepper and Neil McEwan. I am in general agreement with their assessment of the "Catt Anomaly".

I will limit my comments to the region of the electromagnetic spectrum corresponding to "microwave" frequencies. Hence, the wavelength of electromagnetic waves are very much greater than the atomic and hence, electron spacing in a good conductor. Our view is one of looking at the macroscopic effects, not microscopic.

Conductors are material whose atomic outer shell (valence) electrons are not held very tightly and can migrate from one atom to another. These are known free electrons and for metal conductors they are very large in number. Assuming, one valence electron per atom, then the number of free electrons equals the number of atoms in the material since the material maintains charge neutrality. Hence, we have a "sea" of electrons in the metal. With no applied external field, these free electrons move with different velocities in random directions producing zero net current through the conductor. If an electric field is applied, there is a net migration of electrons parallel to the electric field, hence current flows. However, if we consider individual electrons, when an electron is added at one end of a structure (e.g. a transmission line), one leaves the other end of the structure and charge neutrality is maintained. If we tag the entering electron, we find that it is not the electron that leaves the structure. The electron that leaves, is one that was already near the output and was forced out by the addition of an electron at the input. This is the same phenomenon that we see in fluid flow. When a liquid flows through a pipe, adding a droplet of fluid at the input of the pipe causes an immediate expulsion of a droplet of fluid from the output of the pipe, however, it is not the same droplet. When viewed from the input and output the system exhibits a finite yet extremely fast response time, however, the time required for any given droplet to propagate through the system is much longer than the input/output system response time. Back, to the electrical problem, when a free charge is first placed inside a conductor it is subjected to a static field, the charge density at that point then decays exponentially until the static electric field in the conductor goes to zero. The time constant of that exponential decay is known as the "relaxation time constant", τ_r . For conductors, such

as copper that time constant is of the order 10^{-19} s. This time constant is much shorter than the period of a microwave signal, therefore, we can consider the electrons to always be in a state of equilibrium in the material.

Concerning the question of charges terminating electric fields incident upon the conductors. With no applied electric field, free electrons on average are positioned in the conductor to exactly compensate for the positive charge of the nucleus of the atoms making up the material. When an electric field is applied, the electrons, on average move so that the total electric field inside of the material remains at zero. ($E_i + E_a = 0$). Where E_i is the field within the conductor due to slight net movement of the electrons relative to the fixed atom position. This results in a polarization of the atoms. The distances that any individual electron has to move is extremely small because of the collective effects of many electrons involved and occurs within a period equal to a few relaxation time constants. E_a is the applied field. The net effect of all this is that, an equivalent surface charge appears which terminates the applied electric field. Since the displacement of any individual electron is small, it can follow a rapidly changing electric field as discussed in the Catt Anomaly description. In conclusion, from the microwave point of view, which is macroscopic, the so called "Catt Anomaly" is well understood and does not play a role.

Sincerely James W. Mink Ph.D. Chairman MTT-15
(IEEE) Dept. of Electrical and Computer Engineering, North
Carolina State University 16nov95

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Mink's letter is such a mess that we cannot tell whether he discerns a contradiction between Pepper and McEwan. In an attempt to establish this, the following letter was sent to Mink;

Dear Mr. Mink,

I recently received some interesting correspondence from a dear friend of long standing in England. I find the whole subject most fascinating and need some assistance in clearing up this apparent ambiguity. I wonder if you could help clarify this apparent duality. Do you believe that there is a contradiction between Pepper and McEwan? In thanking you for your time I remain,
Yours sincerely, Francine Russo New York 24feb96
The reference documents are enclosed

This letter was repeated two months later, and still there is no response. Similarly, McEwan and Pepper keep themselves totally incommunicado, apart from the initial letters which their superiors instructed them to send. They all ignore all enquiries by third parties. Here are further letters ignored by Mink;

200a Merton Road,
London SW18 5SW
26 January 1996

Dear Dr. Mink, second copy sent 7may96

The Catt Anomaly

I have seen your letter to Catt dated November 16, 1995.

Is there a fundamental contradiction between Pepper
21june93/23aug93 and McEwan 20apr95? Yours sincerely, T
S Harriss London

encl. Catt anom EWW sep84; Pepper 21june93/partial23aug93;
McEwan20apr95

Dear Dr. Mink,
The Catt Anomaly

With regard to your letter to Catt on November 16, 1995, do you
not find a fundamental disagreement between Pepper, June 21,
1993, and McEwan, 20 April 1995, over the direction from which
the charge comes?

Yours sincerely, Graham Lyons London 29 May 1996

Dear Dr. Mink, 5oct96 [Second copy sent 8nov96]

The Catt Anomaly

Thank you for your letter dated 16nov95

You appear to find no contradiction between Pepper and
McEwan. Is this so?

Yours sincerely, Ivor Catt

Here is a further letter which has been ignored by an embattled professional. Note that these punkah-wallahs all draw salaries from electromagnetic theory. They will ignore every communication, be it from the President or the Queen! (The only exception is their immediate boss, whom they will obey once only, and then defy, see p54. Whether they hide under 'academic freedom', or the Fifth Amendment, or both, I know not! However, we can rest assured that they continue to draw salary.) See how you fare! Write to them, or telephone them!

Dear Professor Pepper, [second copy sent 7may96] 11th February 1996
The Catt Anomaly

I shall be including a brief section on the alleged Catt Anomaly in the book on electromagnetism that I am writing. I have read the exposition of the alleged anomaly in Wireless World Sept84, copy enclosed, and your comment on it in your letter dated June 21, 1993, copy enclosed.

I am anxious to paraphrase you correctly, and so I shall be very grateful if you confirm the following detail;

As the TEM step passes, the electric field is terminated initially by charge rising up from inside the conductor at right angles to the direction of travel of the TEM step. This is because such charge coming from the left would have to travel at the speed of light, which is clearly impossible.

I enclose a s.a.e. for your reply, which need only be to initial the second copy of this letter.

Yours sincerely,

T S Harriss London

McEwan, Pepper, Howie, Mink found that they passed examinations with high marks. This gradually took them further and further up the hierarchy of academe. We have only limited evidence, e.g. McEwan on p6, that they claim competence in electromagnetic theory. It has usually been attributed to them by others. This is the way in which the vital disciplines underpinning our culture gradually disintegrate. Those very few who do have a grasp of electromagnetic theory are elbowed aside by ignoramuses who have floated to the top on a sea of confusion. I have found the same grave situation in my other fields of research; computer architecture and Wafer Scale Integration (see Wireless World, July81 and March89). McEwan, Pepper and Mink show us how scientific knowledge gradually descends into liturgy, examples being their letters. In the same way as the parish priest, having forgotten his theological training, thinks he still retains the key to his religion, so these scientific quacks think they hold the key to their subjects. However, the unanswered questions give them a rare glimpse of the real subject that they should study and discuss. Concern to continue to pay their mortgages and retain the respect of their wives makes them ignore the letters with their awkward questions. Our task is to square the circle; to bring them back into the scientific fold.

Unless we do this soon, science will remain at best sterile, and will more probably disintegrate.

http://www.ivorcatt.com/em_test04.htm
<http://www.electromagnetism.demon.co.uk/08101.htm>
<http://www.ivorcatt.com/2698.htm>

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The background.

Why did I latch onto the Catt Anomaly, and pursue it with vigour? Catt, Davidson and Walton had already been prevented from publishing their lesser advances in electromagnetic theory for a decade by earlier officials who preceded Secker. Then, in May 1976, they made major advances. First, Walton excised Displacement Current. Then, in the same month, Catt discovered Theory C. They withheld this theory for some years, but finally published it in Wireless World in dec80. However, still, today, members of the IEE or of the IEEE, the two major relevant learned institutions in the world, do not know that this team claim a major scientific advance made in may76. Even the fact that an advance is claimed, let alone the nature of the claim, has been suppressed for twenty years! The first admission of the claim is made in a ridiculing aside in Lago's review of my last book, in the IEE's ECEJ journal, oct95, partly reproduced as appendix 4. I had already known about suppression in science, and published my first paper thirty years ago in IEEE Trans. Comp. feb66 under a misleading title, and because of this, it was the only paper on the subject to pass the referees. Nobody else succeeded in publishing on the very important subject of The Glitch until many years later, (Couranz in IEEE Trans. Comp., June75,) because the subject was taboo. This suppression led inevitably to frequent computer crashes, and meant that computers were unreliable. This caused the computer industry to lose the real time market for two decades. My third (and major) paper, finally published in the IEEE Trans. Comp. EC-16 dec67, was delayed for three years in horrendous political wrangling, which involved Narud, the head of R&D in Motorola Phoenix, where I worked, instructing my boss Emory Garth to fire me. Because Emory failed to fire me, he himself had to leave. My paper began to outline the techniques needed to interconnect the fastest ECL logic systems, which we had developed. Our failure to educate our customers meant that the market fell back to our competitors' ten - times - slower TTL circuit, and we lost our market to Texas Instruments. Also, computers

ran much slower for decades. (Narud had refused to develop the slower TTL circuits.)

Twenty years later, in The Daily Telegraph on 1 May 89, the worst suppresser of all, Maddox, long time editor of Nature (recently retired), re-enacted Lewis Carroll's "The Walrus and the Carpenter" when he expressed concern about suppression in science. He wrote that a discovery like Crick and Watson's Double Helix could not be published in today's heavily censored scientific journals. Certainly, censorship is more severe than twenty years ago, when my 1967 paper was delayed for a mere three years.

'It seems a shame,' old Maddox said,
 'To play them such a trick.
 We've led them up the garden path,
 And made them write so quick!'
 J C Williams said nothing but
 'My carpet's not too thick!'

'I weep for you,' old Maddox said:
 'I deeply sympathize.'
 Holding his pocket-handkerchief
 Before his streaming eyes.

'O Scientists,' called Prof Secker,
 But answer came there none -
 And this was scarcely odd, because
 They'd censored every one.

The Earlier Background

After graduating from Cambridge, I published everything that I wanted to publish in the leading learned journals for the next twelve years.

These included the Fall Joint Computer Conference, The IEEE Transactions on Computers, and later New Society and New Scientist. By 1972, it was clear that the British were determined to get out of hi technology. As for me, after twelve years of increasing disillusionment with the slow progress of digital electronics, I decided to start a new career. First, I went teaching Remedial English.

I had already written a book about hire and fire in the U.S.A., which was published in six languages. Now, as a parting shot, I published a further book, "Computer Worship", which discussed the idiocies of the

computer industry. So far, so good. However, the trouble came with my third book, a text book on digital computer hardware design. While researching this, I made major breakthroughs in fundamental electromagnetic theory which were more important than anything I had published in the past. Suddenly, I found that I had gone from 100% acceptance of all my articles for publication to 100% rejection. Since that date, 1973, I have generally failed to publish anything in learned journals, particularly failing in Britain, but also failing round the world. Now that my material was more advanced and important, it was totally rejected for the next 25 years. During that time I have made periodic written approaches to the President of the IEE and similar potentates expressing concern, but to no avail. However, as my reputation worldwide grew, the resulting difficulty for the IEE and other relevant learned institutions kept increasing. Still, they have held to their policy, not even admitted to themselves, to suppress all major advances in the art.

Denied information on my work of even decades ago, other researchers in my specialisms fall further and further behind. They now have no chance of catching up with me and my team; D. S. Walton and Malcolm Davidson, so that today we stand totally unchallenged and unexampled. However, to be such an unnoticed Historical Object gives us no satisfaction.

The decades of suppression have increased the divorce between me and all accredited journal referees for my work, leading to the totally uncomprehending review of my latest book by Lago in the oct95 issue of the IEE Electronics & Communication Engineering Journal. Twenty years earlier, in Wireless World, July79, Lago had attacked our first major dec78 and mar79 publications, on Displacement Current; ".... the articles are wrong in every detail and it is vital that this should be clearly demonstrated before undue damage is done." Now he surfaced again with a second attack, ending with the flourish; ".... this reviewer, after lengthy and careful consideration, can find virtually nothing of value in this book."

That first important dec78 article in Wireless World was photocopied by staff and circulated within U.K.A.E.A. Culham, followed by a meeting there to discuss the situation. The meeting delegated to B. G. Burrows the task of telephoning Tom Ivall, Editor of Wireless World. He threatened Ivall that if he published any more material by Catt et al., Wireless World would be boycotted by the scientific community. (This is exactly the treatment previously meted out to the intended publishers of Velikovsky's first book.)

Ivall should have capitulated. However, he reacted in my favour for two reasons. Firstly, he had independent means. Secondly, he had spent many hours with me and many hours with Burrows, and found my technical stature to be no lower than that of Burrows. Ivall continued to publish material on my theories every month for the next ten years, making me the most published and most read suppressed author in history. However, the reader may not know that if a scientist reads Wireless World (now called Electronics World) he loses caste, much as you would lose caste if you read the "Sun". Certainly, before I published in the semi-reputable Wireless World, I had never read it. Thus, my theories did not reach graduate engineers and college lecturers by being published in Wireless World. Quite the reverse. Wireless World was read by technicians, not by engineers, even though Ivall did not allow such dismal rubbish as slips into the journal today, for instance page 937, dec96.

As the decades drifted by, I continued to fulfil my duty of attempting to get my work published. I also delved deeper into the theory of the Politics of Knowledge, or the Sociology of Science. Basil Bernstein, of the Institute of Education, London, gave me the first clue, which can be paraphrased as follows;

Knowledge is Property, with its own market value and trading relationships, to be protected by those who trade in that body of knowledge.

It was many more years before I realised that

He who brings *new* knowledge is a vandal, much as the Nazis who burned the books were vandals.

The reason is that the intrusion of *new* knowledge results in the rejection of the old books. *New* knowledge has to be defined.

Knowledge is *new* if its acceptance would lead to a change in an A level syllabus. It is also *new* if it would lead to the change of a first degree syllabus. It is not *new* if it would merely lead to the addition of an extra section in a first degree syllabus, leaving the text books untarnished. This last is merely *new* (written without italics).

One has to consider the knowledge broker, or lecturer, with his slabs of lecture notes. Each slab of notes represents capital which brings in sixty pounds of income each year from two hours of lecturing. The professional is unwilling to tear up those notes, or to give up the royalties on his text book. His text book probably gained his promotion.

The professionalisation of teaching in around 1850, and the merging of research with teaching, set the stage for the inevitable ossification of

science a century later. The professional cannot afford to allow knowledge to advance.

Any attempt to push forward the bounds of knowledge by paying professionals to do so must fail. Even when employed specifically to advance knowledge, the professional will freeze it.

The existing knowledge base is the professional's identity, his security, and his income. *New* knowledge threatens all of these.

It took further years for me to realize that the role of the professional institution was similar to that of the educational establishment. In the 1970's, when the IEE was obstructing our efforts to publish and to initiate discussion of fundamentals, we naively assumed that if only we could get past the 'decadent' officials to the 'vibrant' membership, all would be well. I am now convinced that this was a delusion, for the following reasons.

Those students who studied, learned, and passed exams in the IEE's static knowledge base developed subject loyalty and also a vested interest in its maintenance and defence against *new* knowledge. Some had even passed the IEE's own exams. They now paid their subscriptions to the IEE, not to encourage it to advance knowledge, but so that it would defend the knowledge base which was now *their* identity and *their* security.

When working at Lucas forty years ago, the manager told me that the average time a production line girl worked for the company was six weeks. This made nonsense of the SDP idea of worker participation in management decisions. We might as well ask British Rail to have its Board meetings on a platform of Victoria Station and ask the passengers waiting for their trains to help to make decisions on running the railway system, there and then.

Decades later, my son pointed out that the worker's interest was best served if reinvestment were held to a minimum, and his company closed down when he took retirement. That way, his income would be maximised. We can apply the same rule of thumb to the professional engineer, member of the IEE.

My article "The Scientific Reception System as a Servomechanism", Appendix 2, gives the next stage in the argument.

Like the Catholic Church, the IEE paying member would allow the IEE to sin a little - to allow small increments, or changes in, the knowledge base. This mirrors the production line worker benefiting from minor improvements to the existing production line. However, major theoretical advances must be held up until the IEE paying member retires. At that point, the bulk of membership would be younger, of an age to want further delay in the publication of major

scientific advance, and so ad infinitum. Thus, the IEE and its members mirror the conservative stance of the professional lecturer. Neither benefits from major advance, which would cause short and medium term damage to his career. The professional engineer has no interest in major advance in the art. Major advance benefits only;

- (1) putative future generations of engineers, who do not yet pay their membership fees to the IEE, and
- (2) society at large, which does not pay membership fees to the IEE.

The more exposed, and the more absurd, Williams and Secker were to appear, the more supportive and grateful the IEE membership would be that they had risked so much to protect and maximise members' careers.

In the case of electromagnetism, there was good reason why the blocking of advance was particularly easy for the official to come to terms with, without feeling of guilt or compunction. Books on electromagnetism state that the theory was completed a century ago, and no further advance is possible or necessary. Thus, the IEE officials knew that any purported advance was fallacious

[But see <http://www.ivorcatt.com/em.htm>]

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Strategy

At first instinctively, later by design, I devised a strategy based on the following behavioural model. A college lecturer or an IEE official sets out to block major scientific advance while not admitting even to himself that that is what he is doing. It was the intrinsic hypocrisy and self-deception of my adversaries that gave me the possibility of success in causing the Catt Anomaly to become a legitimate subject for discussion. This pioneering attempt to bring one institution, the IEE, back to basics, and causing it to legitimise one subject only, the Catt Anomaly, might be the model for the opening up of the IEE to other matters. We might then move on to reviving all our other defunct institutions, giving us the possibility of scientific advance in the next century, something which the twentieth century lacked. (David Quinn, page 26, had the same idea.)

This last assertion is supported by my experience in electromagnetic theory. In 1964, Motorola hired me to solve the problems involved in interconnecting their very fast (1 nsec) logic gates. This I did, without the help of theoretical ideas generated in the twentieth century; the scientifically dead century. Later, I found that I had been rediscovering

the ideas of Oliver Heaviside, who published them late in the nineteenth century but had since been suppressed. Modern Physics pundits have no knowledge of Heaviside's ideas and of the Heaviside tradition. For instance, nobody in Modern Physics knows about the impedance of free space, 377 ohms, although it is an essential feature of electronic design. I pointed this out in my paper at an IERE/IEE International Conference on EMC, Surrey University, sep84, and nobody has since cited a case where 377 ohms appears in the literature of Modern Physics. The claim that Modern Physics (= The Copenhagen Interpretation) enabled us to reach the moon is false. Neither semiconductor theory nor my interconnection theory and practice rely on Modern Physics.

I was there when major advances were made in integrated circuit technology. They did not rely on Modern Physics; quite the reverse. Modern Physics confused the situation. If it is true that advanced computers got us to the moon, then credit goes to Oliver Heaviside and his successors including Ivor Catt, who did their work in spite of the obfuscations of Modern Physics. (However, the reality is that rocket fuel is what got us to the moon, not computers. It's difficult to miss the moon with your eyes open!)

The missing ingredient in all our institutions is of course accountability. This means that Williams and Secker need to be brought to account, and to be widely known to have been brought to account, pour encourager les autres. One possibility is to serve a Writ in Chancery demanding that they perform the function outlined in Secker's own first letter, to 'promote the general advancement of electrical science and engineering and their applications and to facilitate the exchange of information and ideas on these subjects....'. Since they are breaking the Rules of Conduct for members of the IEE, they are vulnerable, and in principle the mainstream sludgy IEE members cannot protect them. It is of course true that when brought to account, the IEE disciplinary committee, packed with sludge members, will also break those same rules, as it has done in the past, for instance when I reported Professor D A Bell to them. That will also have to be publicised in further editions of this book. The salvation of our civilisation will not be achieved easily, and the forces of darkness will fight a determined rearguard.

Philosophy

We have to make considerable effort to gain some understanding of the behaviour of captains of science like Atiyah, Pepper, McEwan, Williams, Secker and the rest. This will enable us to control and limit

their destructive activity more effectively, and direct them towards doing what they are paid to do. The picture is clarified if we think of them as politicians first, administrators second and scientists third. However, it is probably more useful to think of them as not scientists at all, as Stalin was not a communist or Marxist. More accurately, whether Stalin was a Marxist or not had minimal influence on his behaviour, which was driven by other forces.

The attack on scientific principles was mounted a few decades following the professionalisation of science in the mid-nineteenth century. Professionals feared the career insecurity when they stood on a shifting knowledge base. At a subconscious level they realised that they had to freeze their body of knowledge. Further, they had to suppress the knowledge that they were doing so. This is the dialectic which makes these commissars of knowledge vulnerable and manipulable. Most of them will go to considerable effort to avoid admitting to themselves, and more particularly to their admirers - wives, maiden aunts and so forth, that they represent the forces of darkness.

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Relativity

Relativity came at an auspicious moment. Professional scientists had already made minor errors before 1905, but it was the major error of Relativity which set Modern Physics on its way to ever more nonsense. The beauty of Relativity was that it was self-referencing in that, claiming no absolute space, it seemed to claim no absolute truth. Modern Physics, the new religion, then set upon a lucrative half-century of profitable obfuscation before the chickens came home to roost in 1971 when Shirley Williams, then a Member of Parliament and later (1976-9) Secretary of State for Education and Science, spelled out an unmistakable warning in *The Times*, 27feb71;

For the scientists, the party is over Until fairly recently no one has asked any awkward questions Yet there is a growing suspicion about scientists and their discoveries It is within this drastically altered climate that the dramatic decline in expenditure on scientific research in Britain is taking place.

Much like the incessant, superficially profound, content-free, intoned propaganda for the Holy Ghost, the unremitting propaganda for Modern Physics blinds us to a rational appraisal of its content, including its philosophical content. After much reading of Einstein, Heisenberg, Born and the rest, I have been forced to conclude that the intellectual level of Modern Physics, and of the bizarre Philosophy of

Science that it has spawned, is shallow. (See my letter, The Betrayal of Science by Modern Physics, re-published as appendix 5.)

Philosophers, who should have known better, but who preferred to pick up the crumbs of funding falling from the wealthy Modern Physics table, now buttress a nonsensical Modern Physics with a nonsensical Philosophy of Science.

The Catt Anomaly goes to the core of all this nonsense, since Einstein and the rest put electromagnetism at the centre of Modern Physics.

The special theory of relativity owes its origin to Maxwell's equations of the electromagnetic field - written by Einstein in P. A. Schilpp's book "Albert Einstein, Philosopher-Scientist", pub. Library of Living Philosophers 1949, p62.

If none of the Modern Physics Wallahs can answer the most simple question about where the electric charge comes from, then we can dismiss their Quarks, Strangeness, Neutrinos and the rest as hog-wash. I have to emphasise this extraordinary principle. If a band of Wallahs were to put out unremitting propaganda that they were all brilliant and revered mathematicians, but persistently failed to agree on the sum of 2 plus 2, then you would dismiss everything they said; even more so if, half of them having given the answer three and the other half five, they followed up by saying that they were in agreement! So much for the whole 'scientific' razzmatazz called Modern Physics. The apparent pretence that Pepper and McEwan agree means that the Modern Physics pundits are stocking their armoury with dishonesty as well as ignorance.

p25

The Remedy

The blocking of new information by all our institutions means the end of civilisation. It is of the utmost importance that the facts of the situation be established soon and that remedial action be taken. The remedy is simple - to introduce accountability. I fear that at present a knowledge broker is rewarded for blocking new information.

The necessary reform will be that should a knowledge broker be proved to have blocked new information, he will be dismissed.

p26

AIDS: The failure of contemporary science.

In his above-titled 1996 book on AIDS, Neville Hodgkinson quotes David Quinn on page 335;

The scientific establishment ... bears an uncanny resemblance to Medieval Christendom. It is as totalist and unified in its world view as was the Medieval Church. While heretical movements exist, as they did in the Middle Ages, they are kept at the outer margins of the scientific world via various time-honoured devices for maintaining doctrinal control such as censure, ridicule and de facto excommunication. Organs such as Nature act as a sort of Holy Inquisition.

But the early symptoms of a schism are beginning to develop. The authority of the Catholic Church was challenged over an issue which is to us relatively unimportant, i.e. the doctrine of justification. Yet once that authority was successfully challenged on one issue, it did not take too long for the great unified world view of the Middle Ages to unravel. One can envisage the current scientific 'Magisterium' being successfully challenged over an issue such as Aids, and then, with its credibility damaged, finding itself challenged over a host of other issues.

On page 393, Hodgkinson himself writes;

Perhaps when the illusions are shed and a clearer picture of Aids finally emerges, the enormity of what went wrong will be turned to good advantage by the world of science, as a catalyst for a radical rethink about its observational methods, assumptions, and institutional checks and balances.

I would argue that the Catt Anomaly is the simplest, best honed focus for our attempt to analyse, reform and so save science before it is too late.

wa8anbk4

p27

Black is White

Theocharis, Turin and myself see the denial of absolute truth as the central failure of the twentieth century, from which all its other failures

follow. The decline of science into the obscurantist meta-religion of Modern Physics is best grasped by looking at the religious parallel. So long as a religion has one or more central mysteries, it is invulnerable to attack. Similarly, when the professionals sought to secure their long term career positions, they installed religious mystery at the centre of Modern Physics, flanked by much the same genuflection as that surrounding the central mysteries of a religion. Theocharis has compared and contrasted the mysteries of Christianity with those of Modern Physics, as follows;

CHRISTIAN THEOLOGY

ONE GOD - THE HOLY TRINITY

JESUS - FULLY GOD & FULLY MAN

Nicene Creed (4th century)

Gregory Palmas (14th century)

Soren Kierkegaard (19th century)

MODERN PHYSICS

LIGHT/ELECTRONS - EACH IS BOTH

WAVES AND PARTICLES

Albert Einstein (1905)

Louis de Broglie (1922)

Niels Bohr (1927)

ONE GODEVIL - THE UNHOLY DUALITY

NEILS BOHR - BOTH FULLY MAN AND FULLY WOMAN

CHRISTIAN THEOLOGY

GOD IS LOVE - John

GOD IS LIGHT - John

I AM THE WAY, THE TRUTH,
& THE LIFE

MODERN PHYSICS

ENERGY HAS MASS - Einstein

ENERGY HAS WEIGHT - Einstein

MASS (OR IS IT MATTER?) AND ENERGY ARE EQUIVALENT.

LIGHT IS A FORM OF ENERGY

MAN IS THOUGHT. THOUGHT HAS WEIGHT. A TREE IS A
FORM OF LEAVES

CHRISTIAN THEOLOGY

I BELIEVE THE RESURRECTION BECAUSE IT IS ABSURD

- Tertullian ca 200 AD

MODERN PHYSICS

WE ARE ALL AGREED THAT YOUR THEORY IS CRAZY. THE QUESTION WHICH DIVIDES US IS WHETHER IT IS CRAZY ENOUGH TO HAVE A CHANCE OF BEING CORRECT. MY OWN FEELING IS THAT IT IS NOT CRAZY ENOUGH. - Bohr's reply to a far-fetched idea of Pauli, ca 1957

CHRISTIAN THEOLOGY

How about the metamorphoses of Zeus, or Lewis Carroll's Wonderland. Are they not absurd and crazy enough?

UNLESS YOU BELIEVE, YOU WILL NOT UNDERSTAND - Isaiah
BLESSED ARE THOSE WHO BELIEVE WITHOUT SEEING - John
FAITH MUST PRECEDE REASON

- Augustine

I have observed in teaching quantum mechanics (and also in learning it) that students go through the following experience: The student begins by learning how to make calculations in quantum mechanics and get the right answers; it takes about six months. This is the first stage in learning quantum mechanics, and it is comparatively easy and painless. The second stage comes when the student begins to worry because he does not understand what he has been doing. He worries because he has no clear physical picture in his head. He gets confused in trying to arrive at a physical explanation for each of the mathematical tricks he has been taught. He works very hard and gets discouraged because he does not seem able to think clearly. This second stage often lasts six months or longer, and it is strenuous and unpleasant. Then, quite unexpectedly, the third stage begins. The student suddenly says to himself, "I understand quantum mechanics", or rather he says, "I understand now that there isn't anything to be understood". The difficulties which seemed so formidable have mysteriously vanished. What has happened is that he has learned to think directly and unconsciously in quantum mechanical language, and he is no longer trying to explain everything in terms of pre-quantum

conceptions - Freeman J Dyson, "Innovation in Physics", Scientific American vol. 199, pp. 74-82, sept 1958.

The End of Error

The gimcrack post-Einstein ambience fathered much nonsense, and all of it is inter-related. One gets the hang of what they were up to if one realises that their objective was and remains job security. They all asserted that they were creating a revolution, but none admitted that the purpose was to entrench their careers. The New Physics was characterised in various ways. Heisenberg might replace causality by intentionality, in a bizarre reversion to Aristotle. However, it is convenient to summarise their activity as centred on the denial of Absolute Truth.

Although I can easily conceive of a universe with no absolute space but containing a moral system with absolute validity, the shoddy intellectualism of Brussels-Solvay 1927 (The Copenhagen Interpretation) thought that relativity must needs introduce relativity in morals and in all else. They also introduced the idea of Great Mystery at the centre of their physics, which puts them into the world of religion instead of science.

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The Description

The re-classification of theories as merely descriptions by Modern Physics pundits gave a fillip to the job-security of professional knowledge brokers. Whereas a theory had to be rigorously stated, a description was always imperfect, incomplete. Further, a description was a description of Reality, so that it could not be untrue, since reality is true by definition. New experimental evidence would merely help to enrich the description. Popperian refutation became impossible.

Under the new science of Modern Physics, the reigning theory is a description of physical reality. Thus, it could never be wrong in the old sense of classical science. Phlogiston and Caloric could be later adjudged wrong because they pre-dated Modern Physics. Today, no such concept could be excised from the reigning science.

Let us analyse the behaviour of Pepper, McEwan, Secker and the rest over the Catt Anomaly within the ideological framework of Modern Physics. All parties agree that the charge appears on the lower

conductor, because Aristotle - oops! - I should have said Maxwell - said it did and the gentry at the Brussels-Solvay Conference in 1927 accepted this into the creed of Modern Physics. All that is outstanding is the description of where the charge comes from. Pepper and McEwan both described the process of appearance of the charge. Since they only described, as one might describe a sunset, Secker could later on agree with them both! One does not, one cannot really, disagree with the description of a sunset. Under the new reign of Modern Physics, the more descriptions, the better, each description enhancing our grasp of the mystery of the charge's appearance. Wave - particle dualism set the scene for apparently discordant descriptions to be accepted into the glossary of scientific knowledge. We know that the charge appears; any contribution to how it does so is to be welcomed. It is noticeable that Occam's Razor has disappeared from Modern Physics, while Bohr's Correspondence Principle, which is the opposite of Occam's Razor, is celebrated nightly.

Way back in 1980, I claimed that a Mistake was impossible within the bogus, unscientific context of Modern Physics. Today, I ask Modern Physicists Wallahs to (a) show an example of a Mistake in Modern Physics, and (b) show us how a Mistake could be identified within their 'system'. I claim that their system excludes the possibility of a mistake; that it is specifically designed to make a mistake impossible, so that a hiccup in a career is an impossibility. Thus by Popper's criteria, Modern Physics is unscientific. Sycophant Karl Popper, bless his little cotton socks, was career oriented enough not to notice this. He dismissed various disciplines including Marxism as unscientific, but failed to subject Modern Physics to the same analysis outlined in his book "Conjectures and Refutations", pub. RKP 1963. However, Popper's later books address the nonsense in Modern Physics, and he claims that Modern Physicists refuse to respond to his questions. He was later undoing the damage done by his earlier sycophantic books, but too late.

"de Broglie and Schrödinger were far from happy with Bohr's views (later called 'the Copenhagen interpretation of quantum mechanics')" -p91

"Schrödinger, who told me that he was deeply unhappy about quantum mechanics and thought that nobody really understood it." -p92

"Yet I could not [understand] Bohr's 'complementarity', and I began to doubt whether anybody else understood it This doubt was shared by Einstein, as he later told me, and by Schrödinger."

-p93, K Popper, "Unended Quiest", pub. Fontana 1976.

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Appendix 1

The Rise and Fall of Bodies of Knowledge.

- I. Catt, The Information Scientist 12 (4) December 1978, pp. 137-144.

It is argued that the self-protecting nature of the knowledge establishment leads to the suppression of new ideas. Proposals are put forward for the establishment of 'Communication nets' which having no central points are incapable of suppression.

Introduction.

Although the principle of free communication of ideas is a basic tenet of the scientific community, there are numerous examples of their suppression. Professor Herbert Dingle, who wrote a book on relativity in the 1920s as well as a section on relativity for *ENCYCLOPAEDIA BRITANNICA*, and was the man chosen by the BBC to give the eulogy on Einstein when he died, developed doubts about the special theory of relativity around 1955. To his astonishment, he found that the scientific journals and institutions suddenly closed their pages and doors when he wanted to write or say something unorthodox; that is, heretical. A scientist might say, 'something that was incorrect'. He describes his experience in his book, *SCIENCE AT THE CROSSROADS* (1).

Immanuel Velikovsky painstakingly developed the heretical theory that Venus as a planet is only some 3,500 years old, that it moved for centuries on a very eccentric orbit, and about 1500 BC made its two closest approaches to the Earth. During the eighth and seventh centuries BC, the comet Venus repeatedly approached Mars, and Mars in turn menaced our planet. Only after all these encounters did Venus finally lose its last cometary characteristics and settle down to its present planetary behaviour. Velikovsky believes that the effects of these encounters on the Earth, especially the earlier ones, were truly catastrophic. He wrote a book about his theories, called *WORLDS IN COLLISION* (2).

Without reading Velikovsky's book, the Professor of Astronomy at Harvard warned Macmillan not to publish anything by Velikovsky,

saying that if they did, Macmillan would be boycotted by the academic community. Macmillan bowed to the pressure, and fired the editor who had accepted Velikovsky's manuscript, because he had accepted heretical material (3,4).

The computer journals and conferences in Britain and the USA consistently evaded 'The Glitch', the way in which computers spontaneously go mad for no apparent reason. The lengthy private correspondence with the editor of SCIENTIFIC AMERICAN which culminated in his being forced to give 'The Glitch' a passing mention, in April 1973, is very revealing. It took ten years of dedicated hard slog by a group of scientists in the University of Washington, St. Louis, to get it into the professional journal, the IEEE Transactions on Computers, in June 1975.

Many other instances could be cited of the suppression of new or unusual, that is 'heretical', ideas by scientific institutions. The system of refereeing technical articles before publication (and I myself have acted as a referee) is a system of censorship, the censor having no training in how to differentiate between 'wrong' and 'heretical'.

Superficially, it is easy to look at the suppression of free communication in science from the Basil Bernstein point of view (6), that 'knowledge is property with its own market and trading value', to be protected by the practitioners of that particular brand of knowledge - it may be sociology, mathematics, psychology, or some sub-set of these. We might regard the suppression of new ideas and the obstruction of outsiders when they try to trespass into a branch of knowledge as pernicious and retrograde. As one example of many suppressions, digital electronics, otherwise called computer hardware design, can be taught in virtually no college in the world today. It is suppressed by the older knowledge groups of computer science, which means programming, and by electronics, which means telecommunications. Dr Charles Seitz was chased out of the University of Utah when he opened up a laboratory with digital electronic hardware within the Computer Science Department. He then called himself a 'defrocked computer scientist'. (After a long gap, he is now lecturing at CALTECH.)

If we were certain that the suppression of free communication was wrong, it would merely be necessary to expose the fact that editors of scientific publications work to suppress scientific communication, rather than to sustain it; that university faculties work to block new disciplines, rather than help them to develop, and we would organize methods to prevent editors, professors and conference organizers from suppressing new developments in the future.

The Holt Dictum.

However, across this vista, like a blaze of light, comes the dictum of Dr A. W. Holt, 'Without barriers to communication there can be no communication'. This is one of the great profound truths which often appear facile at first sight.

As an illustration of Holt's thesis, when I publish something in a scientific journal, a large part of what I am publishing has already been said before the first word of the piece. The fact that I am publishing in that scientific journal means that I accept virtually the whole of what Galbraith calls the 'conventional wisdom' which is accepted by subscribers to that journal and its editors. This rigidly limits the scope of my communication. I want to publish in that journal because I accept the frame of reference established by that journal and the group of scientists who support it. If something were published in that journal by someone who did not accept virtually all the precepts enshrined in previous issues of the journal, it would carry little meaning, or communication, because having broken with the traditional agreed premises of the journal, no reader would any more know what was still agreed; no one would even be sure what the words in the revolutionary article meant. After all, the meaning of a word is a creature of the frame of reference within which it has traditionally been used. (M. Polanyi in PERSONAL KNOWLEDGE says that every time a word is used, it alters or reinforces its meaning as a result of its being used in a different context (7).)

As further illustration of the Holt dictum, we can take something that the poet Stephen Spender once said. He argued for writing in an already accepted style. He said that if one created a new style, one's own style, one ran the risk of creating an 'historical object', and not communicating. Similarly, one could say that if one wrote a revolutionary article in a journal, one would create an historical object; what one said would be unintelligible to the reader. The only meaningful communication is one which only marginally alters the frame of reference.

In the language of T. S. Kuhn (8) it is permissible to write and speak within the limitations of a shared paradigm, and even to marginally modify the shared paradigm. This is an acceptable, meaningful exercise in what he calls 'normal science'. What is not permissible is to write or say something which contradicts the shared paradigm, and expect it to be tolerated by the accepted journals, conferences and faculties. In so far as such institutions allowed the ingress of revolutionary ideas, they would be inhibiting the proper flow of very

useful communication of the normal kind, of normal science, because the shared paradigm, a necessary frame of reference in normal scientific communication, would be undermined.

Knowledge as Property.

Basil Bernstein writes, apparently critically, that a body of knowledge is property, with its own market value and trading arrangements, to be protected by the social group which administers that body of knowledge. However, one can look at such defensiveness in a favourable way. If no one were to defend the integrity of a body of knowledge against assault from laymen outside, the clarity and coherence of that body of knowledge, and in particular the solidity and validity of the shared paradigm which is its foundation, would be undermined.

Any body of knowledge, which embraces both information and understanding, needs its own body of dedicated practitioners, who exercise their knowledge and keep it alive. Also, they put up barriers around it to defend it against confusion. Without these barriers to more or less random communication, giving precedence to communication between the select few within the barriers, within their journals and conferences (and churches), the body of knowledge that they are protecting would lapse into confusion. That is why 'without barriers to communication there can be no communication'.

New Knowledge.

From time to time, new knowledge tries to break through the defensive barriers into the main body of knowledge, and an important role of the priests within is to analyse these new ideas and decide whether to accept or reject them. All the while they must defend what they already have. It is therefore important that a limit be placed on the amount of new knowledge attempting to break through to the inner sanctum. If too much were allowed in for analysis at any one time the result would be confusion and damage to the valuable body of knowledge already entrenched within.

However, the new knowledge which attempts to break in beyond the barriers and articulate on to the already established knowledge plays an important role. The existence of such conflicts attracts people of high calibre towards the centre of the knowledge and towards its fringes. Even the rejection of a new piece of knowledge is a useful exercise, because in the process the main body of knowledge is exercised, and the practice of manipulating it will be kept alive among the priests in the inner sanctum.

As a body of knowledge increases in size and complexity, the problem created by each quantum of new knowledge which attempts to break through into the inner sanctum is greater. For this reason, the defences surrounding a large body of knowledge are rightly much higher, more difficult to surmount, than those surrounding one that is smaller, less complex and less mature. However, new knowledge still comes in, and the body of knowledge continues to grow, albeit at a slower and slower rate. Unfortunately, however, when the body of knowledge is bigger and the rate of inflow of new knowledge is smaller, more and more of the activity within the knowledge becomes 'celebration', more and more ceremonial rather than exercise in depth. As a result, a different calibre of person is attracted to the large knowledge, lacking the ability to understand and defend a body of knowledge with many levels of meaning. They are 'maintenance men' rather than 'builders'. The central body of knowledge ossifies, becomes brittle and disintegrates. This is how civilizations collapse, how religions and cities collapse, and how a scientific community will collapse.

Growth of Knowledge.

We can expect bodies of knowledge to grow rapidly at first, grow more slowly when they are large, and then steady to a more or less fixed maximum. After some time at this maximum they will disintegrate.

My recent investigations indicate that our knowledge and understanding of electromagnetic theory reached its zenith in about 1910, and we have since lost most of what we knew about the subject. I cannot find anyone in the world today who professes to be an expert on electromagnetic theory, or who is researching into the subject.

The computer art had reached a large size and complexity as a body of knowledge in 1944, which appears to have been its practical limit. Since there has been no advance in the last thirty years (9), it must be well on its way to disintegration.

In the language of Professor Lehman's theory of growth dynamics (10) 'progressive' work has come to a halt and all activity is 'anti-regressive' maintenance work. Lehman says that at this point, further advance can only be made if the foundations of the knowledge are re-examined and streamlined.

However, it is at this point that the Holt barriers to communication play an unfortunate role. By the time fundamental change is needed, we have seen that there are good reasons why the calibre of the 'guardians of the faith', the high priests, will have sunk to an all-time low, becoming worried, inadequate functionaries holding in reverence

their predecessors who engineered the era of fast growth and progress. As the need for fundamental change increases, their blocking of communication of new ideas will become more complete and the established institutions more closed and rigid.

High technology will grind to a halt and even regress unless we fundamentally alter its underlying structure. The key problem is that as a body of knowledge matures, that is, ossifies and becomes decadent, channels of communication are shut off by the vested, mature groups, in a manner vividly described by Dr Charles McCutchen (11).

Need for a New System of Communication.

Clearly, what is needed is a new system of communication between peers which cannot be strangled in the normal way when the relevant body of knowledge reaches maturity. The key to the design of an irrepressible communication system, which we can call a 'Communication Net', is that it should have no central control point, no single focus whose capture leads to strangulation. This is how established institutions are easily emasculated. For instance, control of the staff appointments to a college faculty makes it easy to destroy the elan vital of that faculty. Control of the reviewing process of a professional journal makes it easy to suppress further constructive communication. Similarly the technical conference, with its small cabal choosing the list of speakers, is easy prey to a decadent clique.

I am not saying that the forces of decadence know that they are strangling their social group's future - indeed the essence of their decadence is their ignorance of what they are doing. Generally, they believe they are maintaining standards. We must design a system which retains the good intent of the established institutions - search after truth, free communication, appraisal by peers - but does not have their unsound structure, vulnerable to capture by a career- and prestige- oriented clique. One might even go so far as to say that more rugged structures are a prerequisite for the technological revolution, and that the reason for the failure of high technology to generate vast profit is the strangulation of its institutions.

In principle, a communication net contains equal individuals, each of whom keeps an up to date list of articles that he recommends and copies of which he is willing to supply on request at twice the direct cost involved; 25p would be the kind of sum that another member of the net would send in advance when requesting one article. The reason for charging double is that this gives anyone in the net a surplus of funding which he uses to finance the voluntary sending of unrequested

articles - for instance an important new article, or articles to someone who is being invited to join the net.

A member includes, in his bibliography of a certain subject, only those articles - by himself and others - which he thinks make a contribution to the subject. Each subject will have its own net, and on request a member will supply his bibliographies to all nets of which he is a member. This will break down interdisciplinary boundaries, which is one of the main problems in high technology.

Since membership of a professional institution costs about £15 p.a., it will be reasonable to expect such members to spend about £5 p.a. on communication nets, that is about twenty communications per year; quite enough in practice.

Once the nets are in operation, a prestige-oriented scientist will aim to belong both to a professional institution and to a communication net.

Wide distribution of one's article on a net, particularly if it appeared in bibliographies supplied by a number of eminent experts, would soon become more prestigious than publication in a professional journal. In job applications it would be useful to show that one's articles were recommended by top people in the field - this is a facility unavailable at present.

A member of a net will include in his bibliography a statement of the hours during which he is available on the telephone. It looks as though two hours per week would be reasonable, and it might be necessary to restrain calls by only allowing trunk calls on the net.

Xerography and the direct dial telephone appeared after the philosophical and organizational structure of professional institutions ossified, and the institutions make no concessions to such technological advances. Communication nets should be able to adjust rapidly to new communication developments and opportunities.

In a BBC programme it was estimated that on average a published article was read 1.3 times - that is, articles are read 30% more often than they are published. I asked the editor of AFIPS, a leading computing journal, about this, and he said he thought the figure was probably more like four. Whoever is right, it is clear that even after suppression of important articles, the dissemination of what is allowed through by the censors (reviewers) is ineffective and expensive. It seems eminently economical by comparison to Xerox (say) ten copies of an article and mail them to those likely to read them.

I myself am setting up at least three nets - one being on electromagnetic theory, a subject totally suppressed by the journals. Another net that I shall start will be a net giving advice on what nets

exist. Net design can be expected to improve rapidly during the first ten years or so after their inception, and it is important that improvements in their structure are widely communicated as they are received.

If communication nets are successful, it may be possible to use their structure as the basis for the design of organizations dedicated to other activities than flow of information. These other activities may develop spontaneously within communication nets, or alternatively they may be consciously started at a later date after some experience has been gained with communication nets.

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[Reprinted in I. Catt, Electromagnetic Theory vol. 1, pub. C.A.M. Publishing 1979, p. 117]

Comments made in July 2000 by Ivor Catt.

My website is www.electromagnetism.demon.co.uk/

The last part of the article obviously describes the Internet of today.

However, there are differences. The Internet contains a shadowy central control committee, which we need to obviate. Also, the Internet lacks any system of validation by respected experts in the field.

"Riposte", see my www Home Page, is a more recent idea.

A critical factor is the efficiency of the search engines such as Yahoo. Ironically, The Kernel Machine (see my website), on which my world patents have run out, would have enabled the signal to stay above the noise. Just one such machine owned by Yahoo would increase that company's valuation from \$9 billion to \$90 billion. (The whole Kernel development project only costs £40 million.) However, it is likely that it will never be built. Society's commitment to limiting each computer to only one processor is very strong. (The Kernel Machine has one million processors.) Thus, Search will evermore limit the power of the Internet.

The scientific reception system as a servomechanism

- I. Catt. The Journal of Information Science 2(1980) 307-308.

In order to survive, a body of knowledge must attract funding. 'Funding' can mean, quite crudely, supplies of cash. It can also mean the support of acolytes, or 'researchers', willing to 'work' for nothing and therefore subsidize the body of knowledge. Instead of money, such people accept as payment pieces of paper called 'degrees', institution membership, etc. We shall call this activity 'zero purchase'. To attract funding, the body of knowledge must stabilize and create an easily recognizable destination for funding. This destination may be a university faculty or a scientific institution. Credibility is gained by such an institution if it owns known leading knowledge brokers, or 'experts'. An individual achieves expert status by accumulating status symbols, from Nobel prizes down to A level passes, and by becoming the editor of an obscure journal or by publishing papers and obscure books. An important distinguishing feature of virtually all of these status symbols is that they are not directly profitable at point of purchase. Anticipated fringe benefits are all. For example, the book with low sales and low royalty counts as a status symbol for the author, but the profitable best seller does not.

By indulging in unremunerative activity helpful to a body of knowledge, a would-be knowledge broker gains 'credit points' for 'selflessness' and 'scientific honesty'. If he gains enough such credit points, he may become one of the leading members of the knowledge establishment and recoup his investment of unpaid toil during the previous decades. However, most people who run in the 'academic selflessness' sweepstakes never recoup in cash terms, but have to be satisfied with the periodical reception of further pieces of paper - M. Sc., Fellow of the Institute, CBE, etc.

When a scientist has attained guru status within an organization and helps it to attract funding, it is important for him and for the organization that his guru status should be made secure. He can ensure this either (1) by continuing to maintain mastery of the evolving body of knowledge, or more simply (2) through his refereeing and editorial power, by stabilizing that knowledge and preventing it from developing, or (3) by some combination of the previous two techniques. In practice, he opts for stability but garnished with gradual growth at a pace well within his (possibly by now failing) capabilities. As well as by ownership of gurus, an organization uses its official journals to establish itself as a proper destination for funding (and zero purchase). However, in the same way as a salesman tries not to disturb or confuse the customer when making a sale by throwing doubt on the merit of his product, journals can only serve their purpose if they contain no hint that the fount of knowledge may not reside within the organization. On the other hand, totally bland discourses in its journals (and totally bland lectures by its resident gurus) pose another threat to an organization's money supply; the charge that they have gone to sleep, or are old, decadent and rusty. Discussion and dispute must be seen to occur, and this needs to be reasonably orchestrated so as to give both the indication of internal division (or life) in the organization, but not at such a level as to threaten fragmentation leading to the need for the money source (perhaps a government committee or charitable foundation) to take sides by deciding which fragment to finance in the future. Organizations which fail to 'fine tune' this orchestration have disappeared, so those that survive have succeeded.

A money source (and even more so a 'zero purchase' Ph. D. student) also has to achieve status by pointing to the status of the organization or organizations it supports. In engineering terms, any 'life', or 'dispute', represents positive feedback, a destabilizing factor with dangerous possibilities, contrasting with the stabilizing effect of the reiteration of antique ideas.

Once, many years ago, I designed a triple Darlington amplifier, and was surprised to find that in addition to the heavy D.C. current, it could oscillate at low amplitude and very high frequency, the frequency of the first, small, drive transistor, with the following two high power, low speed, transistors acting passively as forward biased conducting Vbe diodes. This is a good model for the compromise invariably reached by the organizations milking a body of knowledge in order to secure their continued funding. The high frequency, superficial, harmless oscillation, or argument, shows the signs of life

needed to reassure the funding sources, while paradoxically at the same time the large, steady, bland communication lower down serves to reassure. This is why [owners of] a body of knowledge will tolerate, and even encourage, argument and violent disagreement about trivial detail while at the same time blocking all questioning of fundamentals. To change the metaphor, a body of knowledge is like a large raft on which all kinds of violent games can and must be played, but no one must attack the raft on which they stand, because then everyone would drown in new ideas.

Reference.

I Catt, The rise and fall of bodies of knowledge (see above).

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Appendix 2

Battery drives load via long transmission line. Mathematical analysis.

http://www.ivorcatt.com/1_1.htm
[From <http://www.ivorcatt.com/em.htm>]

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Appendix 3

Letter to the Editor, Electronics World + Wireless World, published in May95

What Conspiracy?

In a letter to WW in nov81, JL Linsley Hood writes that "censorship has been effective throughout my own professional career....". He lists nine authors who could not have been published anywhere but in Wireless World.

As Pete Davis (EW+WWDec94) asserts, there is usually no conspiracy to suppress heretical views. There is no need of one, except in some specific instances, because as Charles McCutcheon wrote in the New Scientist (itself a notorious suppressor, but not as bad as Nature) on 29 April 1976, p225, "An evolved conspiracy" suffices. For example, I ran into a discussion in the interval at the Royal Institution seminar to

celebrate the centenary of the Michelson-Morley experiment. An American who was setting up an international conference on relativity discussed with one of the lecturers whether ether buffs should be suppressed at that conference. He also asked the lecturer how Harold Aspden should be dealt with. They concluded that if ether believers kept to Establishment mathematics, they should be allowed to put their case.

The American told me he regarded heresy in science much as he regarded heresy in religion. However, more generally, suppression in science results from fear that a new idea will disrupt the normal, calm progression of academic career progress and research funding. Suppression is the norm rather than the exception. Even Maddox, Editor of Nature, now says he is worried¹. With his track record, that is mind-blowing. Scientists have successfully resorted to false authorship and false addresses to get into Nature. The most interesting, and most destructive, is the pandemic suppression of advances relating to the AIDS epidemic. Other experts, whose names I can supply, specialise in the allied subject of fraud in science. Stewart and Feder lead this field.

My first publication on suppression in science was "The Rise and Fall of Bodies of Knowledge", published in The Information Scientist No 12 (4) dec78, pp137-144, where I discuss some of the cases of suppression which litter science. My article was re-published in my book "Electromagnetic Theory vol 1", 1979, p117. All of the content of that book is suppressed, including the point that I raised at the Michelson-Morley centenary seminar, asking about the apparent paradox in their experiment that although Michelson-Morley pre-date wave/particle dualism, both wave and particle have to be assumed at different stages in the experiment to suppress anomalies.

It appears to me that for the experiment to have any value, the light must act as particles during its travel, because parallel waves would interfere with each other and ruin the experiment; but it has to act as waves on arrival in order to determine transit time difference by interference fringes. In the Michelson-Morley centenary seminar, speaker Professor Kilmister said, "That has never been mentioned before". It has never been mentioned since - being suppressed for good reason.

To raise such questions, and there are many, is cheating, like making your pawn move as a combination of knight and bishop in a chess match. Science today is the manipulation of pre-agreed axioms and old knowledge, nothing more. Further, the request for more detailed statements of the axioms, as in my case with Michelson-Morley, is

resisted to the death. Today's science resembles the religious service, which should not be interrupted by the raising of theological questions. My work on Wafer Scale Integration, described in *Wireless World* July 1981, was always rejected for publication by all learned journals, even though it attracted £16m of funding - including government funding - and became a widely praised product in the field. Of course, its suppression reduced the threat that it would upset the research funding being received in their universities by journal referees for their own approaches to WSI. In spite of my track record, my new WSI invention, see EW+WW March 1989, for which I have worldwide patents, cannot be published in any learned journal.

In a letter in *Wireless World*, January 1983, I wrote that during 25 years of work, I have never succeeded in publishing any of my work on e-m theory in any British learned journal. This ban now extends to 35 years. However, Davis should particularly think about the refusal of the Establishment, when approached, to clarify the classical theory they are defending. Professor M. Pepper FRS and his boss Professor A. Howie FRS, head of the Cavendish, disagree with each other² as to where the negative charge comes from in the Catt Anomaly, EW+WW sep87. They refuse to discuss it with us or with each other, or to say that the matter is of no importance. Not only are new theories ignored and suppressed. We also find that the Establishment is nonchalant about its contradictory versions of old theory. See also the co-existing, hopelessly contradictory, versions of a TEM wave pointed out in 'The Heaviside Signal', WW july79, which has been totally ignored.

Ivor Catt

¹ He says that suppression is increasing. "The epoch-making paper by Francis Crick and James Watson outlining the structure of DNA, which appeared in nature in 1953, would 'probably not be publishable today', Mr Maddox laments" - *Daily Telegraph*, 1may89, p18.

² Howie says it comes from the west. Pepper says that (since electrons would have to travel at the speed of light,) it cannot come from the west, and must come from the south. Until this is resolved, we do not have a classical theory. Before it can exist, a theory has to be stated.

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Appendix 4

Book Review published in the IEE Journal "Electronics & Communication Engineering Journal October 1995, p218.

Electromagnetism 1 by Ivor Catt

Westfields Press 1994

<http://www.ivorcatt.com/em.htm>

The main body of the text is devoted to transmission lines

There are numerous examples of sloppy argument in the text. The flaws in these arguments are easy to see.

The author sees an anomaly in the conventional view of the transmission line. This he calls the 'Catt anomaly' and it is the starting point of his proposals for an improved theory.

The 'Catt anomaly': When a TEM wave travels along a transmission line, there must, according to conventional theory, be charge distributions on the surfaces of the conductors behind the wavefront.

For a vacuum dielectric the speed of the wavefront is the speed of light so that, according to Catt, the charges on the conductors must travel at the speed of light, which is impossible. This is the 'Catt anomaly'.

Since the wavefront does travel at the speed of light, so do the charges, which then have infinite mass. It follows that there cannot be charges on the conductor surfaces and conventional theory must be wrong.

The flaw here is the assumption that the charges move with the wave. whereas in reality they simply come to the surface as the wave passes, and when it has gone they recede into the conductor. No individual charge moves with the velocity of the wave. The charges come to the surface to help the wave go by and then pass the task to other charges further along the line which are already there and waiting. This is the mechanism of guidance and containment. There is no anomaly.

But Catt goes on. Having removed charges from the surfaces of his conductors, he can no longer apply Gauss's law and the displacement current in the wave has to go somewhere. Catt's solution is typically ingenious: the current must continue as displacement current in conductors, which are actually dielectrics with a very high permittivity; there is no conduction current in conductors - ever! Catt's Ockham's Razor has been wielded to remove conduction current as well as electric charge from electromagnetic theory. There is of course the small problem of a value for the permittivity of copper. Catt is equal to the challenge the permittivity of copper must be extremely large.

.... It is significant that, having introduced his new theory and abolished charge and current, he then proceeds to use these concepts quite unashamedly in the rest of the book.

There are many other items in this book which give cause for concern, for example the false statement that 'The TEM wave has virtually disappeared from today's electromagnetic theory'.

Catt's belief in his own work is clearly sincere, but this reviewer, after lengthy and careful consideration, can find virtually nothing of value in this book. **B. LAGO**

The penultimate paragraph echoes Lago's July79 letter in Wireless World attacking my article "Displacement Current" in Wireless World, Dec78 and March79;

.... the articles are wrong in almost every detail and it is vital that this should be clearly demonstrated before undue damage is done.

....

May I suggest that your readers will be well advised to approach the "further reading" with caution.

Lago has surfaced just twice with his large spanner. I know nothing of him except that he is at Keele University.

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Appendix 5

The Betrayal of science by 'modern physics'.

We can classify disciplines as ranging from hard to soft; from physics, engineering, chemistry, biology; through sociology, psychology; to geography, history, literature, religion. The hard disciplines are described as 'science'. In a soft discipline, a model, theory or fact is still of value even if it is imperfect, flawed. The definition of a hard science could be that it is capable of sustaining a perfect, true, model, theory or fact.

For prestige reasons, the soft sciences - sociology and psychology - try to take on the mantle of the hard sciences by using 'scientific method'; a method of arriving at rigid, 'true', facts, models and theories. They do this in order to gain access to the prestige and funding (NASA-type) that the hard sciences command. So we see subjects trying to move to the left, from soft to hard.

Unknown to the soft science careerists, struggling towards the left, the position of their colleagues at the hard, physics end is uncomfortable. This is because if a theory can be exactly true, it is also brittle; more vulnerable to complete overturn by new developments than is the softer, imperfect theory. Now career advancement is, if anything, a soft subject, not a hard one. So for career reasons, a traitor group in physics has developed a soft discipline called 'modern physics'. These careerists betray science by softening their discipline and so stabilizing the theoretical status quo and with it their career status quo.

An individual's career in hard science is brittle, because it is based on more absolute, therefore more brittle, theories and models. He then makes his position more pliable, and his status and career more secure, by softening the brittleness of his discipline. In doing this he betrays his discipline in order to protect and further his career. 'Modern physics', a bastard pseudo-science, is a soft discipline which has been developed by career physicists unwilling to risk a brittle career in hard science.

Meanwhile, the soft sciences (sociology and psychology) trying to obtain the prestige and funding of the hard sciences are not fearful of this brittleness. In any case 'modern physicists' are telling them that physics is soft.

The signposts on the road from physics to modern physics - from hard science to soft - are: uncertainty; (wave-particle) dualism; confusion of the observer with the observed; relativity; and the use of statistics and probability. Paradoxically, one of these, statistics, also signposts the opposite march of the soft sciences towards the hard. - Ivor Catt.

First published as a letter in Electronics and Wireless World, July 1987, p683

178anbk8

p49

Appendix 6

The Conquest of Science

*We are the hollow men
We are the stuffed men
Leaning together
Headpiece filled with straw. Alas!
Our dried voices, when
We whisper together
Are quiet and meaningless
As wind in dry grass
Or rats' feet over broken glass
In our dry cellar*

*Shape without form, shade without colour;
Paralysed force, gesture without motion;*

Those who have crossed

*With direct eyes, to death's other Kingdom
Remember us - if at all - not as lost
Violent souls, but only
As the hollow men
The stuffed men.*

- T. S. Eliot, *The Hollow Men*.

The rise of digital electronics has highlighted weaknesses in our approach to the fundamentals of electromagnetic theory. My twenty years of research into digital electronics led me to put forward a revolutionary theory of electromagnetism, "Theory C", in *Wireless World*, December 1980. I concluded as follows;

The direct transition from [classical electromagnetism] to Theory C is similar to the change in combustion theory from phlogiston to oxidation, but is more difficult. Phlogiston is very similar to electricity, being a strange 'fluid' which permeates solids. But whereas the oxygen which 'replaced' phlogiston was still within the same body, the energy current which replaces electricity is not where the electricity was; it is where it was not. This is a very difficult transition. If the idea of replacing phlogiston caused mirth at High Table, we have to expect Theory C to generate widespread hilarity.

In the event, Theory C took off like a lead balloon. It has during the subsequent ten years been totally ignored by all accredited members of Academia, and I have had no success in my attempts to publish it in any learned journals.

*Here we go round the prickly pear
Prickly pear prickly pear
Here we go round the prickly pear
At five o'clock in the morning.*

The scurrilous reason for suppressing advances in science is easy to outline. Entrenched professors and the like need a stable knowledge base which will form a sound launching pad to project them into higher career orbits - FRS, Nobel Prize etc.

*This is the dead land
This is cactus land
Here the stone images
Are raised, here they receive*

*The supplication of a dead man's hand
Under the twinkle of a fading star.*

However, this easy rationalisation for suppression should not blind us to the other, less immoral justification for suppression, which results from the present fashion in the Philosophy of Science.

Both K. Popper and T. S. Kuhn regret the majority view in the Philosophy of Science, which Popper calls "Instrumentalism".

What they now care about, as physicists, is (a) mastery of the mathematical formalism, i.e. of the instrument, and (b) its applications; and they care for nothing else.

- K. Popper, *Conjectures and Refutations*, R.K.P. 1969, p100.

According to the instrumentalist view, the validity or falsity of a theory has no importance. All that matters is its usefulness as an instrument for predicting practical results.

*Between the idea
And the reality
Between the motion
And the act
Falls the Shadow
For Thine is the Kingdom*

An entrenched academic will value past practical results, attributing them to traditional theory, and be suspicious of promises for the future from the new theory.

*Between the conception
And the creation
Between the emotion
And the response
Falls the Shadow
Life is very long*

Given this situation, it is unfortunate that the "Catt Anomaly" (Electronics and Wireless World Sept.87) should have been discovered after the discovery of Theory C (WWdec80), because the instrumentalist justification for ignoring Theory C does not apply to the Catt Anomaly. Quite the reverse. The Catt Anomaly discusses matters which an instrumentalist regards as central to scientific activity

- the prediction of practical results by an established theory. The Catt Anomaly is a question, not a theory; and it is a question about the operation of the established theory of electromagnetism. To an instrumentalist, it is of the utmost importance that Classical Electromagnetism (i.e. Theory N, EWW Oct84) make some statement as to where the extra electric charge comes from in the lower conductor. If the current fashion in the Philosophy of Science enables accredited academics to evade what I regard as some part of their duties, it provides no defence at all for ignoring the Catt Anomaly.

*Between the desire
And the spasm
Between the potency
And the existence
Between the essence
And the descent
Falls the Shadow
For Thine is the Kingdom*

If a Reader in Electromagnetism makes no written comment on the Catt Anomaly, then he is in dereliction of his duty.

Now that it has been clearly pointed out that I rest my case on the Catt Anomaly, we have a clear test of the good faith of those who are receiving salaries from electromagnetic theory. If there is no response, then we will have proved that there is no competence in electromagnetism within academia.

*The eyes are not here
There are no eyes here
In this valley of dying stars
In this hollow valley
This broken jaw of our lost kingdoms*

*In this last of meeting places
We grope together
And avoid speech
Gathered on this beach of the tumid river*

*Sightless, unless
The eyes reappear
As the perpetual star
Multifoliate rose*

*Of death's twilight kingdom
The hope only
Of empty men.*

-T. S. Eliot, *The Hollow Men*.

Basil Bernstein was the first to point out that knowledge is property with its own market value and trading relationships, to be defended by the group who administer that body of knowledge. Today, each group of knowledge Barons defends his demesne, his body of archaic knowledge, by the cynical use of spurious pseudo-philosophical double-talk and double-think; wave-particle duality, uncertainty principle and the rest.

This is the way Science ends. This is the way the Renaissance ends. This is the way the world ends, not with a bang but a whimper.
Ivor Catt, January 1993.

Additional notes follow, also written in 1993.

".... I am probably the best known name in this field, but nobody with accreditation in the subject will admit to having heard or read my theories, or comment favourably or unfavourably on my theories or competence. In particular, nobody with accreditation in electromagnetic theory will admit to having heard of, or comment on, the Catt Anomaly (EW+WW September 1987), on which I rest my case [Note 1].

As a result, the question of whether text books and college courses should be modified cannot be addressed"

- *Electronics World and Wireless World* June 1993, p469.

".... All those with accreditation in electromagnetic theory, that is who earn salary or royalty or Nobel Prize on the back of it, keep their heads down, as usual. Could their students have a go at them [to] put something in writing?

I will give £50 to the first student who gets a Reader in Electromagnetism or equivalent to comment in writing on the Catt Anomaly. The editor of this magazine will judge (*Not if I can help it - Ed.*) the matter of whether the comment is a serious contribution. - Ivor Catt, EW+WW Aug93, p677"

There was no response to any of this. It's frozen out. -IC

Note 1. Aspects of my theories were discussed in almost every monthly issue of *Wireless World* from 1978 to 1988. However, even

those accredited experts who published responses to my theories; Professor Bell (ex-Reader in Electromagnetism at Birmingham University) and Ken Smith/Joules Watt (University of Kent), claimed that they had not read them and were not rebutting them. However, the then editor Tom Ivall confirms that they were commenting on my theories. See Electronics and Wireless World dec87 p1251; "The solution to the conundrum, that Bell claims that he was not replying in August 1979 to the Catt article of December 1978, is that the way the Establishment replies to a new theory is to restate the old theory, and so his claim arises out of semantic ambiguity".

The Master, Trinity College,
Cambridge.

10sep96

Dear Sir Michael Atiyah,

I enclose a copy of "The Catt Anomaly", pub. Westfields Press, 1996. Please instruct Professor M. Pepper FRS to advise as to whether he finds contradiction between his explanation of the Catt Anomaly, p4, and that of The Reader in Electromagnetics, University of Bradford, p6. I promise that his response, and any further comments by him, will appear in future issues of the book, along with this letter.

Yours sincerely, Ivor Catt.

[Second copy sent recorded delivery to Atiyah on 1oct96, requesting acknowledgement]

[Third copy sent to Atiyah 1nov96, enclosing copy of Gardiner's 1oct96 letter (below)]

[Fourth copy sent 2dec96; fifth on 23dec96; sixth on 20jan97]

p54

The Dean of Engineering,
Bradford University BD7 1DP (01274 733466

10sep96

Dear Professor John Gardiner,

I enclose a copy of "The Catt Anomaly", pub. Westfields Press, 1996. Please instruct Neil McEwan, HoD Electronic and Electrical Engineering, your Reader in Electromagnetics, to advise as to whether he finds contradiction between his explanation of the Catt Anomaly, p6, and that of Professor M. Pepper FRS, Trinity College and The Cavendish, p4. I promise that his response, and any further comments by him, will appear in future issues of the book, along with this letter.

Yours sincerely, Ivor Catt.

[Second copy sent recorded delivery to Gardiner on 1oct96, requesting acknowledgement]

From Prof. Gardiner 1oct96

Dear Mr. Catt,

Thank you for your letter, received today by recorded delivery, regarding the copy of 'The Catt Anomaly', which you sent to me in September. I can confirm that this has now been forwarded to Dr. Neil McEwan for his comments. I will get in touch with Dr. McEwan and request that he contacts you direct regarding his response.

Yours sincerely, Professor J.G. Gardiner

To Professor Gardiner From Ivor Catt 1nov96.

[repeated 16nov96, 23dec96, 20jan97]

I have not heard from McEwan.

Yours, Ivor Catt

p55

The log-jam identified.

To the Chief Executive, IEE 5/11/95 Second copy sent 29/4/04 (see p71)

Dear Dr Williams,

The Catt Anomaly

The enclosed letters, all written by IEE officers, show disarray in the IEE.

You may recall that matters started with Catt's letter to you highlighting the discrepancy between Bradford (McEwan) and Cambridge (Pepper). Secker and the IEE backed Cambridge, until suddenly on 25 Oct. 95 they switched to backing Bradford. On 26 Oct. 1995 your representative Secker disqualified himself from the matter.

I am certain that Catt only wants the IEE to fulfil its role as outlined by Secker on 4 Sep. 95 and "promote the general advancement of electrical science and engineering and their applications and to facilitate the exchange of information and ideas on these subjects".

This performance of its stated duties is also requested by Miller OBE, Simmonds FIEE, Turin (subject of BBC Horizon Program on 27 Nov. 95), Ivall (former Editor of Wireless World) - an IEE Journal announces forthcoming discussion; discussion occurs; agreed summary of discussion is reported in an IEE Journal.

Please advise if financial considerations are restraining the IEE from doing its duty.

Yours faithfully [signed] Eugen Hockenjos, B.Sc., DipHE.

encl. Hamlin/Miller 9nov95; Secker/Ivall 25oct95; Secker/Catt
4sep95; Secker/Metzer 19sep95; Secker/Simmonds 26oct95;
Wilson/Simmonds 9nov95; Turin/Williams 15nov95

The silence is deafening.

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31dec99

Dear Sirs,

The Catt Anomaly

by I. Catt, pub. Westfields Press, 1996, ISBN 0 906340 13 6

(To exclude the possibility of personality problems, I have not until now communicated with the main parties direct.)

The book with the above title was published in 1996. It is available on my website, and there is a copy in Trinity College Library, Cambridge. Since then, the Lynch-Catt paper on the problem was given at the IEE Group S7 Conference on 10 July 1998. This paper was later published in the Conference Proceedings, and is available on my website, (the key diagram, p3 of the book The Catt Anomaly, being enclosed herewith).

Your responsibility in this matter is discussed in the book, which is about to be re-issued.

You are invited to send me your comments for inclusion, unedited, in the new edition of the book. Your comments will also go onto my website.

You may also want to avail yourself of "Riposte", which is explained on my website Home Page. This enables you to have a hyperlink from anywhere on my website, to a website of your choosing, to rebut any assertion made on my website.

You may or may not wish to respond to these specific questions;

1. Is the Westerner view (Howie, McEwan) incompatible with the Southerner view (Pepper)?
2. Are you a Westerner or a Southerner?

3. Should a conference be convened to discuss The Catt Anomaly? (See p55 of my book.) If so, who should organise it, who finance it, and who should be guest speakers? (I note that G De Santillana, in *The Crime of Galileo*, pub. 1955, writes that the main mistake in handling Galileo [the earth moves] was to approach it administratively, which is your mistake over The Catt Anomaly. "... if a decision had to be taken, a council was in order. To deal with the question on an administrative level [Note 1] was not only an arbitrary procedure; it was an inexcusable mistake, which is the necessary premise to the graver mistake of the trial sixteen years later..." - De Santillana, p137) [Dava Sobel, *Galileo's Daughter*, pub. Fourth Estate 1999, is very good. - Ivor Catt, july01.]

4. Should Ivor Catt have approached the matter differently, and if so, how? How should he approach the matter now?

Best wishes, Ivor Catt

cc; Professor JG Gardiner, Dean of Engineering, University of Bradford, BD7 1DP, UK

Dr. N.J. McEwan, Reader in Electromagnetics, University of Bradford, BD7 1DP, UK

Professor M Pepper FRS, Cavendish Laboratory, Cambridge CB3 0HE

Professor A. Howie FRS, Cavendish Laboratory, Cambridge CB3 0HE

Professor Broers, Vice Chancellor, Cambridge University.

Professor Atiyah, Emeritus Master, Trinity College, Cambridge

Professor A Sen, Master, Trinity College, Cambridge

The Secretary, IEE, Savoy Place, Londo, WC2R 0BL

Professor Secker, IEE, Savoy Place, London WC2R 0BL

James W Mink, IEEE, Chairman MTT-15, North Carolina State University, Box 7911, Raleigh, NC 27695-7911

Robert T Wangemann, Managing Director, Technical Activities, IEEE, 445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855-1331

Note 1. "... Dr. Mink generously took his personal time to provide you with a reply. With respect to the views of Professor Pepper and Dr. McEwan, he stated that "I am in general agreement with their assessment of the 'Catt Anomaly'."

We do not believe it to be appropriate to again search out a volunteer to review another volunteer's reply." - RT Wangemann.... 5feb97.

Dr. P T Warren, The Executive Secretary, The Royal Society, 6 Carlton House Terrace, London SW1Y 5AG

"Two Fellows of the Royal Society, Professor A Howie and Professor M Pepper, give diametrically opposed versions of a rudimentary aspect of electromagnetic theory, the subject central to their expertise which

led to their appointment as Fellows of the Royal Society" - IC to Dr PT Warren, Royal Soc, 24sep95

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Further Reading

Political-sociological

References on p37.

Caton, Hiram,

[Truth Management in the Sciences](#)

Truth management in the Sciences. Search (Australia) vol. 19 no. 5/6, sep/nov88, 242-244. On my website

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ibid., letter to Catt, 15mar96, available from Catt.

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Kuhn, T.S., The Structure of Scientific Revolutions, pub. Univ. of Chicago Press 1970, pp109, 132, 148; "....talk through each other...." repeated three times

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Polanyi, M, Personal Knowledge, pub. RKP 1969, pp146/8.

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ibid., Electromagnetism 1, pub. Westfields, 1994.

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To The Editor, IEE Electronics & Communication Engineering Journal.

5oct96

[Second copy sent 11nov96, asking for acknowledgement of letter.
Receipt was duly acknowledged by a card on 12nov96]

Dear Sir,

I enclose a review copy of The Catt Anomaly.
Your journal reviewed my previous book in oct95, see enclosed copy of that review. In its second column it referred to the Catt Anomaly.

Yours sincerely, Ivor Catt [31dec99. No review appeared.]
[3oct02. Still no review. IC]

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IEE Science, Education and Technology
IEE

The history of electrical engineering
26th Weekend Meeting
10-12 July 1998
University of East Anglia

DIGEST OF PAPERS PRESENTED
Organised by Professional Group D7
(History of technology)

HEE/26

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A DIFFICULTY IN ELECTROMAGNETIC THEORY

by Arnold Lynch and Ivor Catt

We seem to have two different systems of electrical theory almost but not quite independent of each other. The difficulty has existed for more than a hundred years but appeared unimportant until the last twenty years or so.

....

....

P2/2

Now we describe a problem which combines the two types of theory and shows the difficulty mentioned in the title of this paper. It arose about twenty years ago when fast-operating silicon chips were connected to one another. We idealise the problem slightly. Imagine a coaxial transmission line terminated by a matched load at the far end; and for simplicity let it be evacuated, and of very low resistance.

Apply a step voltage to its input; a wave travels along it with the velocity of waves in free space. So after a time a current begins to flow in the terminating load; that is, electrons start to move through it. The problem is - where did they come from? Not from the input, because electrons have finite mass and so they cannot travel at the velocity of waves in free space. (Remember that we are considering a step voltage, not an alternating one.)

One of us sent the problem to various people who might have been expected to provide an answer, and the responses were mainly of two kinds (ref. 1): (1) that the wave causes radial movements in the line as it passes over them, and that electrons displaced in this way at the far end make up the current; or (2) that electrons move along the line, with velocity less than the wave, but push other electrons on in front of them, keeping pace with the wave.

This problem was mentioned in the Institution's Wheatstone Lecture last December. The lecturer said that electrons in a metal travel only slowly but that they can transmit a fast electromagnetic wave by "nudging" their neighbours ("nudging" was his word for it). Our comments on this are: each atom in a metal contributes a few free electrons, so there are rather more electrons than atoms and therefore they are spaced from each other by a little less than the spacing of the atoms - say about a tenth of a nanometre. The size of an electron is not known, but it is presumably much smaller than an atomic nucleus, which is about a millionth of a nanometre. That is, the electrons are

spaced apart by more than 100,000 times their diameter. So they cannot deliver a nudge without moving, and they cannot move instantaneously because of their mass.

....

....

REFERENCES

1. I. Catt, "The Catt Anomaly" (Westfields Press, St. Albans), 1996
2. A. C. Lynch, "Half the electron", Engineering Science and Education Journal, 6, pp 215-220 (1997)

Dr. Arnold Lynch is an Honorary Research Fellow in the Dept. of Electronic Engineering, University College, London; correspondence can be addressed to him at 8 Heath Drive, Potters Bar, Herts, EN6 1EH

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At the Institution of Electrical Engineers (IEE), London, Dr. Arnold Lynch gave the evening centenary lecture on J J Thomson's discovery of the electron. When I asked him why, he replied that JJ had told him about it. Arnold is now in his eighties. The attendance for his evening lecture was around 200 or 300. The other four lectures that day drew audiences of around 20.

Various sources tell me that Arnold's reputation in the IEE is very high. The IEE always refused to publish anything on Catt Spiral, a computer invention which was developed by Sinclair and led to product in the field in 1989. After it had attracted investment totalling £16 millions, the IEE did publish commentaries on the project by their own staff. All the same, the IEE continued its 30 year embargo on any publication by Catt, or any discussion in its journals of Catt's theories of electromagnetism. Catt continued to not exist in the field of electromagnetism (e-m).

Recently, Lynch said that the Catt e-m had not been treated properly. His interest centred on the Catt Anomaly. This is an anomaly in classical e-m which I tried to publish during the past ten years after my own theories had been suppressed for thirty years by the IEE. He proposed a joint Lynch-Catt paper, and I agreed. As the pressure increased on IEE officials, they told him that they were desperate for the paper to pass their referee system. They promised him that it would be very thoroughly reviewed, and that if rejected, reasons for rejection would be given. In the event, it was rejected and reasons for rejection refused.

Lynch then suggested to his friend Dr. Colin Hempstead, Chairman of IEE Professional Group S7 (History of technology), that a joint Lynch-Catt paper be given at their annual conference; "The history of electrical engineering", on 10july98. This was done, and the paper was then published in the Digest of Papers Presented (HEE/26) Now see IEE paper.. The paper outlines the Catt Anomaly, and its first reference is the book (available on this website) of the same name which lambasts the IEE for its obstructive behaviour during the last third of a century. (Note that this is the least appropriate section of the IEE in which to announce state of the art advances in e-m theory. When I pointed this out to my friend Robert Whiston, he replied; "Of course. It's all in Machiavelli."

Lynch tells me that he will continue to try to get a paper published in an IEE journal. [july00. No success yet.]

july00. Quote from p12 of this book; Also we note Secker 25oct95; "'The reason that the Catt Anomaly has been around so long is that the 'experts' have not thought it of sufficient standing to take the trouble to demolish it!" When Dr. J. C. Williams blew away, Secker became Acting Top Dog in the IEE. Does he think the Catt Anomaly has gained sufficient standing yet to be worth demolishing? What is demolishing whom?

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McEwan's Snow Job

18jan00. McEwan, after four years incommunicando (he only ever wrote once, in 1996, under instruction from his boss, and then ignored all further communications from third parties and instructions from his boss to write again), now does a snow job, garnished with the 'confidential' card, and salted with grovels to Pepper FRS, a Southerner. [McEwan should have grovelled to Pepper FRS's boss Howie FRS, who, like McEwan, is a Westerner. I.C.1feb00]

Dear Mr Catt,

I am offering a reply to your recent correspondence. I do hope you will accept that this is entirely friendly and disinterested, and that I have honestly tried to explain the problem.

I'd just like to first make a few personal comments about myself.

[About 600 'confidential' words erased by I Catt.]

.....

I hope you will understand therefore that I simply can't afford to get involved in a lot more correspondence on this issue, but I offer below

some thoughts which I hope will help.

.....

I must say that I don't think you are doing anything useful by stirring up issues of north versus south, east etc.

I will trust to your integrity to treat my above comments, especially about

my own circumstances, as totally confidential.

[See p55 of the book "The Catt Anomaly", on this website, quoting Catt's 10sep96 letter to McEwan's boss; "I promise that his [McEwan's] response, and my further comments on him, will appear in future issues of this book." Should I now break my promise? These 'scientists' always play the 'confidential' card.]

Now let me make a few comments for public consumption:

"I previously offered to Mr Catt a simple explanation of how the charge is conveyed along the transmission line. I used an uniform array of N electrons and N positive ions spaced out along a section of line of length L . I then pointed out that if we push in one extra electron at the left of this section, and redistribute the $N + 1$ electrons uniformly over that section, there appears a net unbalanced charge of one unit which is distributed nearly uniformly over that section, but none of the charges involved had to move a distance greater than L/N within the time it took to redistribute the charges. The large values of N actually involved explains why the particle velocity really is so small. This is the gist of my explanation which I won't repeat in detail as I assume Mr Catt has already included it and will recap it as necessary.

I still stand by this as a basic explanation of how the charge is carried along the line. As I explained before, I think the anomaly only appears to exist because there is a confusion about the identity of the charges involved. The charge which actually supports the line voltage is actually a very slight unbalance between very large densities of positive and negative charges which are already in any given section of line before the propagaing wave reaches them. (Note the italics!) My description shows that a pattern of unbalanced charge can move far more rapidly than the individual charges involved. (I could make the obvious analogy with sound waves; after 1 second I hear the sound from a lightning stroke 340 metres away but it is perfectly obvious that none of the atmospheric molecules that were around the original discharge have arrived at my ears. Putting it a bit facetiously, I don't smell any ozone at the same time as the sound arrives and there certainly aren't any 340 m/sec winds blowing round my head. But

surely the idea of particles transmitting stress to other particles is already clear enough.)

I would like to emphasise that my description using N charges in a line was a deliberately simplified one intended to get over the key concept without a lot of detail. This leads me to my next point.

I am prepared to take slight issue with Prof Pepper - again in a completely friendly way I hope - about the main component of the velocity of the charges. My recollection is that he agreed with me that the required charges are already in the section of line to start with, but I think he implied that the charges move laterally outward to generate the surface charge as the wave moves over them. I would assert that the main component of particle velocity is longitudinal.

In fact it is easy to show that the current flow must have both lateral and longitudinal components, so I agree with Prof Pepper that there are lateral charge movements but I do assert that the longitudinal velocity components are the larger ones. We can go into this in a little more detail:

The surface charges on the metallic conductors exist only in a very thin surface layer. Classical theory doesn't give any indication of the thickness of this layer. To do it properly means solving the wave mechanical equations for the states of the electrons near the surface. This I am not competent to do. However, this distance scale is obviously an atomic one.

Within the conductor deeper than the surface charge layer, we will find there is no unbalanced charge density. We now have to introduce the concept of skin depth. The current flow along the conductor occurs within a layer near the surface whose thickness is the skin depth.

Because the skin depth varies inversely as the square root of frequency, we are obliged to consider individual frequency components in the propagating pulse. However the skin depth is very much greater than the surface charge layer thickness up to very high frequencies, as (for copper) it is about 9 mm at 50 Hz and about 2 microns at 1 GHz.

The implication of this is that the moving electrons must have both transverse and longitudinal components of velocity. They have to arrive at the surface of the metal, yet flow within a much thicker region. To arrive at the surface, they must, as Prof Pepper says, move sideways. However, if they only moved sideways, there would still not be any net charge imbalance in any small section of line. So here I am saying that Prof Pepper's description is incomplete, there have to be longitudinal motions as well. You can imagine the lines of the current flow field (at a single frequency) as like semi-loops in which one end

of the loop starts on a patch of positive surface charge, bends round very sharply within the skin depth, then goes longitudinally along and terminates on a negative surface charge patch. I emphasise again, however, that no individual charge originally at one end of the loop has to arrive at the other end; only small individual velocities are involved.

(This can be put a bit more formally using some mathematics. Because there can be no unbalanced charge density within the conductor, the current flow field must have zero divergence, i.e. if we use an x - axis along the cable axis and a y - axis normal to the conductor surface, then we must have $dU_{subx}/dx + dU_{suby}/dy = 0$. Here U_{subx} and U_{suby} are the x and y components of the current density flow vector. Now the first term is certainly non - zero because the velocity does exist on the left of the wave front and not on the right of it. This implies that U_{suby} can't be zero. I include this only as shorthand for the benefit of those who are familiar with this kind of maths, but it isn't essential.)

For the high frequency components within the propagating pulse, the ratio of the longitudinal velocity components to the transverse ones will be the approximate ratio of the wavelength of the guided wave to the skin depth. For components at sufficiently low frequencies where the skin depth becomes larger than the conductor transverse dimensions, the corresponding ratio will be of the order of the ratio of the wavelength of the wave to the transverse dimension of the appropriate conductor. I believe that in all virtually all practical cases this ratio is very much greater than unity.

I am sure Prof Pepper will not be in the least offended by my raising this contention, and anyway I am quite prepared to be shot down about it if I myself am wrong.

Within the approximations of the classical equations, the problem of the step wave propagating along a line made of conductors of finite conductivity can in principle be solved numerically using the finite-difference time domain method. I am not certain that the software that is actually around can cope well with the different length scales of the skin depth and the inter-conductor spacings. I don't have time to look into this, but if anyone else would like to have a go (or maybe even has done it already and I am not aware of it) I believe they will be able to demonstrate a current flow field similar to what I described: I think it will show almost purely longitudinal velocity components, uniformly distributed across the conductors, a long way behind the wave front, and transverse components that increase as you approach the propagating wave front.

I have noted Mr Catt's comments where he says that one explanation of the wave transmission (and I believe it is correct) is that the electrons transmit the wave by each one "nudging" the next. [Nothing to do with Catt. Catt's co-author Dr. Lynch said this idea was presented by the lecturer at the IEE 1997 Wheatstone Lecture.] The point he [Lynch] raises here is that the spacing between the electrons is very much greater than the radii of the particles. I hope I am correct in interpreting his problem as: "how do they nudge each other if they are a long way from touching?" I have to say that I believe this is a total red herring. The particles don't have to touch each other to transmit the force; if you push one electron closer to another, the second one gets a nudge because the electrostatic repulsion acting on it increases. The increase, however, is not felt instantaneously by the second, but only after the time taken for light to travel from one to the other. (At this point we could now get into several very interesting further questions, but they are really sidelines as far as the resolution of the Catt anomaly is concerned. One is the question of what is meant by the radius of the electron. One possible definition is the radius at which the electrostatic field ceases to obey the inverse square law. There is also a classical definition based on the electromagnetic scattering cross section, and a quantum radius which I don't understand. I don't believe these quantities are connected, but I would be most interested in the comments of expert physicists. Another fundamental problem is what keeps particles together under their internal repulsion. This certainly isn't dealt with by Maxwell's equations, as they stand, but neither is it a problem for explaining the wave transmission problem. Again I simply don't know what the present state of knowledge is about these points, and would be interested to hear about recent developments from experts who are up to date. At extremely high frequencies, there are indeed effects due to the finite rate of acceleration of electrons in conductors under applied force. I believe the characteristic frequency at which this becomes important is the plasma frequency of the metal, normally somewhere in the X-ray region, I think. Finally a still higher level of description is to treat the electron movement using quantum mechanics.)

To show there is a problem with an existing physical theory, you either have to show that it is logically self-inconsistent or that it fails to agree with experimental observations. My conclusion is that, although Mr Catt's problem does provide many interesting exercises in applying the available theories, it still doesn't manage to meet my criteria for showing that there is a problem with them."

(end of "public" material)

To conclude, I hope you will think carefully about my comments and accept them as my best and most honest attempt to explain the issue, within the limits of my knowledge.

[Approx. 200 more 'confidential' words erased by Ivor Catt]

Very best wishes,

Neil McEwan [18jan00]

p66

Co-author Dr. A. Lynch to Ivor Catt, 30jan00

Dear Ivor,

My physics dates back to the 1940's, since when I have usually called myself an electrical engineer. But I think the spacing of atoms in a solid or liquid is about 0.3nm, and the size of an atomic nucleus is less by a factor of thousands, so that energetic particles are able to pass through a thin film of solid with few collisions. The size and shape of an electron are, I believe, unknown. McEwan discusses the "nudging" sensibly, but he appears to assume that the electron is spherical - otherwise why "the" radius?

....

....

.... There are, however, no doubts about J.J.'s discovery [which J.J. described to young Arnold Lynch, now aged 83, - I.C.]: electric charge is associated with inertia, and this is what matters for your Anomaly.

Yours sincerely, Arnold Lynch

Comment by Ivor Catt, 1feb00.

Lynch first pointed out in our joint IEE paper that electrons are too far apart to nudge each other. Here, he points out that they must be far apart, not only in diameter, but also in their power to influence events, with large unaffected spaces between, "so that energetic particles are able to pass through a thin film of solid with few collisions." He is moving towards the suggestion that if electrons nudged each other, then X-ray photography would not work. - I.C. 1feb00.

"Encyclopaedia Britannica 1910, vol 9, p237

"Electron The size of the electron is to that of an atom roughly in the ratio of a pin's head to the dome of St. Paul's cathedral. it has been suggested that its inertia is wholly electrical"

The electron has long arms, and nudges, not with its shoulders, but with its finger tips. – I Catt 2002

p67

From Sir Andrew Huxley, OM, FRS [Nobel prizewinner, ex Master of Trinity College, Cambridge.] 14may00

Dear Mr. Catt,

I much enjoyed our conversation at dessert in Trinity a week ago. Thank you for your letter. Before I received it, I got your book [The Catt Anomaly] out of the library at Trinity. My reactions to the main point, as stated on your p. 3, are as follows.

It seems to me that an anomaly such as you describe might arise if the two-conductor waveguide were capable of transmitting a step function some orders of magnitude sharper than the one with a rise time of 1 ns as you discuss [I do not. IC]. For a given amplitude of step, the peak current will be inversely proportional to the rise time. [It is

independent of the rise time. IC.] I am not familiar with quantitative aspects of conduction in metals but electrons might have to travel with the speed of propagation of the wavefront if the risetime were perhaps (10) -15 sec, involving Fourier components at frequencies comparable to those of visible light. However, such a wavefront cannot be conducted along a metallic waveguide for the reasons explained by Neil McEwan in the part of his letter that you quote on p. 8, middle, i.e. the wavefront becomes smoothed out because the high-frequency components are attenuated, and your original proposition is based on a situation that cannot exist. As I said, I am not familiar with the quantitative aspects of the relevant theory but I suppose that the immediate reason why the waveguide cannot transmit these very high frequencies is the finite resistance of the wires, but if this were negligible then transmission would fail precisely because it would require electrons to travel at speeds approaching the velocity of light and, as you point out, this is impossible because their energy would approach infinity.

With a risetime of the order of 1 ns such as you discuss [I do not. IC], the currents are several orders of magnitude smaller than what would be carried if all the electrons moved at the speed of light, and the situation is correctly described both by Prof. Pepper in the second paragraph of p. 5 of your book and by Neil McEwan on p. 8 of your book., i.e. the huge number of free electrons present in the metal need only to move at a small fraction of the speed of light to carry the current.

I confess that I find it unsatisfactory that you dismiss Pepper's discussion as "drivel" (p. 5, bottom) and make no attempt to explain what you think is wrong with it.

An analagous situation exists in nerve conduction, the field in which I worked for many years with Alan Hodgkin. The best-understood nerve fibre Yours sincerely,
 Andrew Huxley.

p68

Ivor Catt, 121 Westfields,
 St. Albans AL3 4JR, etc

27may00 second copy sent 2july00

Sir Adrian Huxley, OM, FRS,
 Manor Field, 1 Vicarage Drive,
 Grantchester, Cambridge, CB3 9NG
 Dear Sir Andrew Huxley,

The Catt Anomaly

Thank you for your letter dated 14may00.

I quote from your letter; "I confess that I find it unsatisfactory that you dismiss Pepper's discussion as 'drivel' (p. 5, bottom) and make no attempt to explain what you think is wrong with it."

I would refer you to page 11, bottom, of the same book The Catt Anomaly; "... Pepper, (defying Gauss's Law by) producing charge from the south from inside the conductor like a rabbit from a hat.... The Westerner view could have been brazened out, but Pepper's ingenious but mad Southerner view could not."

According to Gauss's Law [see below], rearrangement of charge already in the relevant section of the conductor could not enable it to terminate more electric flux than heretofore. Movement of charge "... at right angles to the direction of propagation of the wave " (Pepper, p5,) can have no bearing on the Catt Anomaly.

The growing scandal which is The Catt Anomaly has nothing to do with me. McEwan pontificated on it once only in apr1995, and then went incommunicado for five years. Pepper pontificated on it once only in 1993, and then went permanently incommuncado. I never communicated with either of them. I first commented on their behaviour in dec1996, in my book The Catt Anomaly.

Since, initially, Secker of the IEE backed Pepper the Southerner, the disagreement between these two men, who continue to earn salary for teaching this material, needs to be addressed. Nobody, including the IEE, has deigned to comment on the request written by Hockenjos on 25.11.95. (p55, The Catt Anomaly.) Why not? How does science advance?

Best wishes,

Ivor

Please regard material to follow on Gauss's Law, as Appendices to this letter.

".... Gauss' theorem, which states that the outward flux of D from any closed surface is equal to the enclosed charge." - G W Carter, Professor of Electrical Engineering, Leeds Univ., The Electric Field in its Engineering Aspects, pub. Longmans 1954/59, p311.

"Gauss' law says that the net number of lines emerging through a closed surface depends only on the total charge surrounded by that surface" - A F Kip, Professor of Physics, Berkeley, Calif., Fundamentals of Electricity and Magnetism, pub. McGraw-Hill 1962, p32.

Appendix. 2june00

S Ramo, J R Whinnery, J van Duzer, Fields and Waves in Communication Electronics, 3rd Edn., pub. Wiley 1994.

p6 "... electric flux out of a closed surface = charge enclosed (3)

This is Gauss's law It is thus a most general and important law."

p129 "Maxwell's Equations in Large-Scale Form

[circular integral] $D \cdot ds = [\text{volume integral}] [\rho] dV$ (1)

....

....

"Equation (1) is Gauss's law the electric flux out of a closed surface at a given instant is equal to the charge enclosed by the surface at that instant."

S R H Hoole and P R P Hoole, A Modern Short Course in Engineering Electromagnetics, pub. OUP 1996

p80 "The Divergence Theorem or Gauss's Theorem

[triple integral] $V \cdot dR = [\text{double integral}] A \cdot dS$

....

The divergence theorem is intuitively obvious."

p118 "Gauss's Theorem

Gauss's Theorem for electric fields is one of the most fundamental in the study of electricity [p119] The advantages of working with such a theorem are readily apparent"

I Catt, Electromagnetism 1, pub. Westfields Press 1994, p1

Battery and resistor. Steady state.

We start with a conventional view of a battery with voltage V connected via two uniform perfect conductors to a resistor R (Fig.1). A steady current flows round the circuit, through battery, conductors and resistors. Ohm's Law tells us that the voltage equals the current

multiplied by the resistance. Therefore the current is $I = V/R$. Every point on the surface of the upper conductor is at potential V , and every point on the surface of the lower conductor is at a zero potential. The space between the two conductors, shown in cross section (Fig. 2), is filled by tubes of electric displacement D . Each tube of electric displacement terminates on unit positive charge on the upper conductor and unit negative charge on the lower conductor. This is Gauss's Law, which later became one of Maxwell's Equations.

A Einstein writing in a book by Schilpp, P. A.; Albert Einstein, Philosopher-Scientist, pub. Library of Living Philosophers, 1949, p62.

"The special theory of relativity owes its origin to Maxwell's equations of the electromagnetic field."

p70

Footnote

So the disgraceful saga continues. There seems to be no limit to the damage that institutions are willing to sustain, and the damage they are willing to inflict on society, before doing anything about the Catt Anomaly. Again, I would emphasise that technical incompetence in the I.E.E., Cambridge University, the I.E.E.E. and elsewhere does not prevent these institutions from administering a conference to sort the matter out. However technically incompetent, it is obvious that any one of these institutions could administer the conference. That is obviously what is needed.

Ivor Catt 6th July, 2000

ivorcatt@electromagnetism.demon.co.uk

www.electromagnetism.demon.co.uk/

[For reasons of priority, the following two items, intended for future edns. of my books Electromagnetism 1 and Electromagnetics 1, were added to the 2001 edition of this book]

Irrelevant notes.

re my 1994 book Electromagnetism 1.

Electron. p6

We get rid of the outer sphere, and the capacitance does not fall to zero. (If $r=1\text{cm}$, $C=1\text{pF}$)

We then reduce the radius of the inner sphere towards zero. The energy, or voltage, increases towards infinity. However, to avoid infinity, we scale down the energy current field as we do so, so that when r reaches zero, the total energy (i.e. total charge) remains finite.

Gravity. p8

Bring two crystals (Fig. 20) up towards each other. "When a pulse attempts to exit from a transmission line it reflects without inversion." (col.2, p8) While outside, finding it is hedged between two crystals, it travels a short distance sideways in the space between the crystals. It then reflects without inversion. This superposition of two pulses of the same polarity results in a positive force. This is gravity, which is always positive. [notes end.]

p71

From: Hayden Taylor <htaylor@iee.org>

Cambridge University Engineering Society,

Monday, August 13, 2001 11:17 PM

Subject: Offer to speak

Dear Mr Catt, I understand from Maral Shamloo that you have very kindly offered to lecture to our Society about electromagnetic theory.

[You could say that. <http://www.electromagnetism.demon.co.uk/07091.htm>

Ivor Catt 14aug01.] The research associated with the Catt Anomaly certainly sounds extremely absorbing, and I think that many of the people studying in the Department of Engineering would be interested to learn more about it. I would suggest 15 November, but if you would rather come on another date then please do suggest one that would be convenient for you. I think that a weekday other than a Friday would be best. I would anticipate that your talk would begin between 6 and 7pm. Most Engineering Society talks last for about 40 minutes, and tend to be followed by 10 to 15 minutes of questions. Afterwards, there would be a buffet dinner when those who had attended the talk would be able to meet you informally. The talk would be held in a lecture theatre equipped to project from a laptop computer, 35mm slides, a video cassette, or acetate foils. The Society would of course be willing to reimburse your travel expenses. I do hope that we can arrange this talk.

With best wishes;

Hayden Taylor,

Trinity College

Cambridge CB2 1TQ

T 07879 637 052

E htaylor@iee.org

Hayden Taylor, I am happy to accept that date and time. Please point potential attenders to the book "The Catt Anomaly", which is at <http://www.electromagnetism.demon.co.uk/wbbanbk1.htm> and in Trinity Library. I have today mailed to you two copies of my 1994 book "Electromagnetism 1". I would sell further copies through you before 15nov01 at half price (+p&p) in an attempt to get some of it read before 15nov01. It would be helpful if you managed to get attenders to pre-study the two books. Further, it will be very helpful if some attenders had read about the disappearance of the TEM wave, see <http://www.electromagnetism.demon.co.uk/17136.htm> . You need to give academics every possible opportunity to be able to fault my

talk. Also, please make great effort to get them to attend I would like to invite you as my guest to the 15sep01 conference that I chair;
<http://www.electromagnetism.demon.co.uk/2001.htm> (The above email could be circulated by you by email and in paper form.) Ivor Catt

Dear Mr Catt, Thank you for your email and telephone message: I am very pleased that you are able to speak to the Engineering Society and I look forward to your talk with enthusiasm. Thank you also for sending the copies of "Electromagnetism 1", and the "Sunday Times" article. I am sure that we can arrange for your talk to be successfully publicised in the ways you have suggested. I shall be out of the country for the next week, but after I return I shall be in touch again to discuss details, in particular connecting the Acorn Master to the Internet while you are lecturing. With best wishes, Hayden Taylor.
 19aug01

To the Chief Executive, IEE
 Savoy Place, London WC2R 0BL

25/11/95

This second copy sent 29april 2004.

Dear Sir,

The Catt Anomaly

For an outline of the problem here discussed, the disarray in the IEE, please go to p61 of the book The Catt Anomaly in your IEE library, shelf no. 537.8. It is also at www.ivorcatt.com/28anom.htm . This letter is at pp55 and 71.

You may recall that matters started with Catt's letter to the IEE Chief Executive highlighting the discrepancy between Bradford (McEwan) and Cambridge (Pepper). Secker and the IEE backed Cambridge, until suddenly on 25 Oct. 95 they switched to backing Bradford. On 26 Oct. 1995 your representative Secker disqualified himself from the matter.

I am certain that Catt only wants the IEE to fulfil its role as outlined by Secker on 4 Sep. 95 and "promote the general advancement of electrical science and engineering and their applications and to facilitate the exchange of information and ideas on these subjects".

This performance of its stated duties is also requested by Miller OBE, Simmonds FIEE, Turin (subject of BBC Horizon Program on 27 Nov. 95), Ivall (former Editor of Wireless World) - an IEE Journal announces forthcoming discussion; discussion occurs; agreed summary of discussion is reported in an IEE Journal.

Please advise if financial considerations are restraining the IEE from doing its duty.

Yours faithfully [signed] Eugen Hockenjos, B.Sc., DipHE.
encl. Hamlin/Miller 9nov95; Secker/Ivall 25oct95; Secker/Catt
4sep95; Secker/Metzer 19sep95; Secker/Simmonds 26oct95;
Wilson/Simmonds 9nov95; Turin/Williams 15nov95

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